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Marina Drobnjak

Renewable Energy Sector in The Republic of Serbia: *Constraints in Renewable Energy Market Development*

Master thesis

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Author: Marina Drobnjak

Supervisor: Mgr. Karel Svoboda, PhD

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Abstract

This thesis analyzes the challenges associated with the countries in socioeconomic and political transition when on the path of integrating into the developed world unions or on the path of fulfilling projected renewable energy targets. As an example country, or as a study case here, The Republic of Serbia has been selected. The thesis addresses the question of how the Renewable Energy Market in Serbia is developing and how are the challenges being addressed.

Thesis reveals that main obstacles come from the ownership of the energy and the power gird assets which are still entirely owned and controlled by the State. Due to this fact it is hard to introduce the planned renewable projects, mostly to be developed and owned by foreign entities, and at the same time to be forced to reduce domestic power production out of the thermal power plants. However, by being on the path to the EU, the renewable energy targets and the RES (Renewable Energy Sources) market have to be accomplished and the government has to show full legislative and policy support. It is also realized that there is a significant discrepancy between the "say and do" in the case of The Republic of Serbia, at least so far. The thesis highlights the important driving factors that, despite of the local resistance and sluggishness, contribute to continuous progress and push towards the RES market development and for reaching the final goals in The Republic of Serbia.

Keywords: Serbia, Renewable Energy, Energy Market Development, Political Economy, RES policy, emerging markets

Abstrakt

Tato práce analyzuje problémy spojené se zeměmi v sociálně-ekonomické a politické transformaci, které stojí na cestě integrace do rozvinutého světa nebo cílí na naplňování projektů obnovitelné energie. Jako příklad země, nebo případové studie, bylo vybráno Srbsko. Práce odpovídá na otázku, jak se trh s obnovitelnou energií v Srbsku rozvíjí a jaké problémy řeší.

Práce ukazuje, že hlavní překážky pramení z vlastnictví energie a mocenské výhody, což je stále plně v rukou státu. Vzhledem k tomuto faktu je těžké prosazovat plánované projekty obnovitelné energie, typicky uskutečňované a vlastněné zahraničními subjekty a zároveň požadovat snížení domácí produkce tepelných elektráren. Avšak tím, že Srbsko usiluje o vstup do EU, má za nutné cíle rovněž podporu obnovitelné energie a trhu RES a vláda jim musí ukazovat plnou legislativní a politickou podporu. Avšak je třeba si rovněž uvědomit, že je u Srbska (alespoň doposavaď) významný rozpor mezi "říci a dělat". Práce zdůrazňuje důležité hnací faktory, které i přes místní odpor a netečnost, přispívají k neustálému pokroku a tlačí k rozvoji RES trhu a k dosažení konečných cílů Srbska.

Klíčová slova: Srbsko, Obnovitelná energie, rozvoj trhu obnovitelné energie, politická ekonomie, RES politika, formující se trhy

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague, **29.07.2016** **Drobnjak, Marina**

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Institute of International Studies
Master thesis Proposal

Author: Marina Drobnjak

Superevisor: Mgr. Karel Svoboda PhD.

Topic: „Renewable Energy Market Development in The Republic of Serbia: Constraints in Renewable Market Development“

Research Question: How are obstacles and constraints being addressed in the RES market development?

Hypotheses: External and internal factors play important role in the RES market development as well as in addressing the key obstacles however, a conflict of interest may exists due to the energy assets ownership by the State and therefore development is slow.

Outline: RES Policy driven business case, Serbia: Internal Drivers of RES market development, Serbia: Internal Drivers of RES market development, Lessons Learnt from Projects (by sector), Conclusion

Literature Review: combination of scientific and practical literature including data compiled from insittuions such as the World bank, IMF, Eurostat
Scientific articles from
the UN “Framework for Climate Change, Adoption of the Paris Agreement” (publishing year: 2015, “Daugbjerg, Carsten and Halpin, Darren (2010) 'Generating Policy Capacity in Emerging Green Industries: The Development of Organic Farming in Denmark and Australia', Journal of Environmental Policy & Planning”, International Renewable Energy Agency) “Renewable Energy in South Eastern Europe - Practical Policies for Financing Renewable Energy Action Plan Investments” (publishing year: 2013).
Ministry of Energy and Mining official Registry, Legislations and Policies provided by relevant Ministries , Company websites and IFI websites in accordance to Projects in Relevant Field

Date: 29.07.2016

Signature:

Signature of Supervisor:

Contents

List of Abbreviations

AERS	Agencija za Energiju Republike Srbije (Energy Agency of The Republic of Serbia)
CAPEX	Capital Expenditure
CEE	Central and Eastern Europe
CIRSD	Center for International Relations and Sustainable Development
DHP	District Heating Plant
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EIB	European Investment Bank
EMS	Elektromreze Srbije (in English:Serbian Transmission System Operator)
EPS	Elektroprivreda Srbije (in English: Electric Power Industry of Republic of Serbia)
EU	European Union
FDI	Foreign Direct investments
GDP	Gross Domestic Product
GEF	Global Environment Fund
GGF	Green Growth Fund
GwH	Giga Watt Hours
HDI	Human Development Index
HEAL	Health and Environment Alliance
HPPS	Hydro Power Plants
IFC	International Finance Corporation
IFIs	International Financing Institutions
ILB	Banca Intesa Leasing Belgrade
IMF	International Monetary Fund
IPA	Instruments for Pre Accession
IRENA	International Renewable Energy Agency
JGF	Joint Grant Facility
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau ("Reconstruction Credit Institute")
KwH	Kilowatt hours

MTOE	Million Tonnes of Oil Equivalent (unit to quantify the amount of energy which is released by the burning of a million tonnes of crude oil)
LCOE	Levelized Cost of Electricity
MW	Megawatts
NALED	National Alliance for Local Economic Development
NIS	Naftna Industria Srbije (in English: Oil Industry of Serbia)
NPL	Non Performing Loans
NREAP	National Renewable Energy Action Plan
OECD	Organization for Economic Cooperation and Development
PPA	Purchasing Power Agreements
P-PPP	Preliminary Privileged Power Producers
PPPs	Privileged Power Producers
PV	Photovoltaic
RES	Renewable energy sector
SEEPEX	South Eastern Europe Power Exchange
SHPPS	Small Hydro Power Plants
SNS	Srpska Napredna Stranka (in English: Serbian Progressive Party)
TPP	Thermal Power Producers
UN	Untied Nations
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WB	World Bank
WBIF	Western Balkans Investment Fund
WeBSEDFF	Western Balkans Sustainable Energy Direct Financing Facility
WEF	World Economic Forum

Introduction

European Integration and European enlargement is a process that brings numerous transformations to countries candidates affecting many aspects of their society. Countries such as The Republic of Serbia, which is an EU candidate[1], are obliged to implement and reproduce the same policies as the EU member states.[2] At the same time, the World becomes highly alert due to the evidently increasing global pollution or CO_2 emissions, contributing to the global warming and climate change. Numerous studies and reports indicate that thermal power plants using coal fuel are among the highest polluters and therefore, it is necessary to make a steady replacement of these power plants by environmentally clean energy sources like renewables (wind, solar, tidal, etc.). Still, primarily due to its investment cost, the Renewable Energy Sector (RES) is the industry which requires political and governmental promotion and support for the both, the related energy market development as well as the projects construction processes. Available renewable resource potential in the country is considerable and in order to realize it, specific policy, finance and technical aspects are to be addressed.

Since the RES market is a new market in The Republic of Serbia, the establishment of completely new dimensions influencing the development is foreseen. These new establishments take forms of market liberalization, law amendments, creation of new institutions, improving transparency, involvement of international institutions, transfer of knowledge and raising awareness. All the mentioned aspects are crucial, as The Republic of Serbia is a country going through challenging socioeconomic times, and naturally, the level of risk of investment is therefore even higher.

RES market formation in The Republic of Serbia is a slow process and is one that goes through different phases. In The Republic of Serbia we observe market initiation, sluggish market formation, and the obstacles which exist in different phases of a project completion. This indicates that the country has not yet experienced full market consolidation.

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[1] European Commission, Serbia, Membership Status, 2015, http://ec.europa.eu/enlargement/countries/detailed-country-information/serbia/index_en.htm, date accessed: July 2016

[2] European Commission, Conditions for Membership, 2015, http://ec.europa.eu/enlargement/policy/conditions-membership/index_en.htm, date accessed: July 2016

By studying the practical examples of ongoing projects in this field, it becomes apparent how external and internal factors have impacted RES development in the country. The mitigation of risks and the establishment of incentives have been crucial and are currently an important feature attached to this emerging market. This thesis tries to understand the conflicts between old and new energy markets, and addresses concerns from all stakeholders involved. Special focus is placed on the investor perspective highlighting the challenges that exist for this new market development. Naturally, the slow initiation of the market and policy adaptation is derived from the mentioned conflict.

The RES development in The Republic of Serbia is often considered locally by some parties, at least by the coal power generators, as a threat and a competitor that could lead to future reduction of their production, and therefore, reduction of the revenue that might further result in a potential job loss as well. This climate, as well as the certain political and related influential lobbyists contributes to the slowing down of the overall RES market establishment as well as it adds to numerous practical obstacles in the overall process. The opinion of the key stakeholders that the RES benefits will also go mainly to the external factors, contributes to the difficulty in the local policy adaptation and full market liberalization.

Due to all of the above factors, the role of foreign entities in the risk mitigation and RES promotion is of high importance in The Republic of Serbia. With their strong and targeted activities in the country, access to RES projects financing is enabled, RES is promoted in a positive way, as an industry that could contribute to retaining talent by opening new jobs in the country and most importantly, it is emphasized that the country is on the right path to improve the living environment and health conditions by replacing polluting generation with the clean generation that is continuously available in the nature without added cost.

Overall, the intention of the thesis was to encompass different stages of development of the RES in The Republic of Serbia as well as to answer the question of how external and internal factors play a role in this market evolution. It is also an attempt to walk on the bumpy path of change in the country, from its fuzzy business environment to the transparent and well defined business conditions, at least the ones related to the energy market. Interestingly, despite that this is a very actual and trending topic, there have been thus far not many up to date studies compiled with focus on

different aspects and challenges involved in the RES market development in countries in transition or better to say, the lesser developed countries.

1 Literature Review

In the course of preparation of this thesis various publically available scientific and statistical documents have been utilized. The literature used for the first part of my thesis mainly covered general knowledge on renewable energy sources, the related global trends, specifics of the RES policies and the associated risk mitigation instruments. These documents are a combination of scientific and government reports published on the Internet sites of numerous well known and respected institutions. Some of the examples are as follows: Clearinghouse "Renewable Energy - an Overview" (publishing year: 2001) which provided me with a general high level overview of RES, the American Physical Society, the UN "Framework for Climate Change, Adoption of the Paris Agreement" (publishing year: 2015), the United States Department of Commerce "Top Markets Report on Renewable Energy - a market assessment tool" (publishing year: 2016) all of which provided me with valuable information on the global and European trends in the field of RES.

In order to explore different aspect of policy formation related to "green markets", various sources have been employed. One source in particular, "Daugbjerg, Carsten and Halpin, Darren (2010) 'Generating Policy Capacity in Emerging Green Industries: The Development of Organic Farming in Denmark and Australia', Journal of Environmental Policy & Planning" revealed the different aspects of the new market development, relating to policy capacity. The mentioned study addressed three main aspects of policy creation in which are included: the state capacity, the interest groups presence and the combination of the both for policy creation. Furthermore, a useful study also from the journal of environmental policy and planning: S.Cetkovic,"Policy capacity for promoting green sectors reconsidered: lessons from renewable electricity and organic farming sectors in Serbia" was used. This article contributed to the establishment of my outline focused on addressing the theoretical framework for policy creation and analysis of policy development and finally the policy capacity vs. empirical examples of projects in the sector.

In order to comprehend the industry specific policy requirements, it was also necessary to utilize official documents such as the report(s) by International Energy Agency (publishing year: 2011), UNDP (United Nations Development Program) "Frame Work to Support Policy Makers in Selecting Public Instruments to Promote

Renewable Energy Investments in Developing Countries" (publishing year: 2013) and IRENA (International Renewable Energy Agency) "Renewable Energy in South Eastern Europe - Practical Policies for Financing Renewable Energy Action Plan Investments" (publishing year: 2013). Additionally, valuable publicly available information was extracted from the report by energy consultancy firms such as Ecofys and Fraunhofer Institute: "Impact of Risks in RE Investments and Role of Smart Policies" (publishing year: 2016). The above sources were crucial for understanding and differentiation of RES investments and risks as opposed to other energy projects investments and risks.

Through my research, I conclude that main phases of the RES market development can be identified as: the initiation phase, the market takeoff phase and the consolidation phase. The above mentioned frameworks, studies and publications were great tools for further utilization of the Republic of Serbia's case in policy development, and as a basis for the assessment of policy and market formation in the country.

In the second chapter of this thesis, it was necessary to address Republic of Serbia as a country whose business environment is shaped by the transitional political and economic process. It was crucial to address the aspects of the country in figures, in which official data was compiled from respected institutions such as: "Trading Economics, Comparisons and Statistics (publishing year: 2015-2016)", the World Bank Country Data (publishing year: 2016), IMF "Global Competitiveness Index 2015", World Bank's Doing business reports, the Serbian Statistics Agency on Status of Unemployment and Brain Drain (publishing year: 2015), the Serbian Investment and Export Agency (SIEPA) on further statistics and information on business climate, the UNODC (United Nations office on Drugs and Crime) on corruption and crime (publishing year: 2013). The World Bank and the IMF were especially important sources as they are globally respected institutions in terms of categorization and measurements of indicators of country's developments and competitiveness. The above sources helped to elaborate on the disadvantages and advantages in Republic of Serbia's investment climate which is, again, highlighted later in this thesis with respect to the RES industry.

Information about the transition process in the Republic of Serbia was researched through reports by the IMF "Western Balkans, 15 years of economic transition" (publishing year: 2015), and "Economic Annals: Privatization in Serbia Result and Institutional Failures" (publishing year: 2011). It is worth to say that the IMF was the main catalyst for neoliberal economic reforms in the World, therefore,

publications by the IMF are considered as sources of considerable importance. The mentioned reports were used to identify key challenges in the country, as seen by a financial institution, stemming from the transition and to evaluate aspects that still need improvement. These aspects are identified to be of high significance in the RES development.

For the section on the energy sector in general, valuable data was derived from sources such as "Eurostat" on Electricity prices (with comparisons to other countries) (publishing year: 2014), Balkan Energy News "Country Reports 2015", UNECE (United Nations Economic Commission for Europe) "Energy Sector in Serbia" (publishing year: 2013) and Energy Community and World Energy Data on Electricity Generation (publishing year: 2013). Facts on the actual project planning as well as the RES implementation information were excerpted from the EPS (Elektro Privreda Srbije) Website and the official register of Privileged Power Producers (PPP) from the Ministry of Energy and Mining. The mentioned sources provided understanding of the Republic of Serbia's energy sector including existing issues as well as the RES potential and its importance for improving the current energy situation in the country.

Information related to the relevant laws and amendments was mainly extracted from the official documents published by Republic of Serbia's ministries such as Ministry of Construction, Transport and Infrastructure. This was particularly covering various drafts and amendments on the construction law (publishing year: 2014). Considerable number of documents published by the Ministry of Energy and Mining in regards to energy law, and associated laws such as the PPP law were of a big help. In terms of identifying the national strategy and priorities, the official documents from the National Strategy for Sustainable development were reviewed as well as government documents such as the "National Renewable Energy Action Plan 2013", published by the Ministry of Energy and Mining and also the excerpt from a strategy report "National Priorities of Republic of Serbia", published by the "UN Country Partnership Strategy 2011- 2015".

The mentioned literature provided the key resources for identifying the country's commitment to energy diversification. Furthermore, an analysis of the laws was a crucial part of this thesis as certain aspects required improvement for efficient RES deployment in Republic of Serbia.

Information on the business endeavors of all major financial institutions and development funds was usually available from the published official documents on the

projects which these organizations have been involved in. Also, Serbia's Ministry of Energy and Mining has compiled progress reports, as an obligation to the Energy Community of South East Europe (ECSEE), in which the developments of the RES market are stated, including the interaction from international finance institutions (IFIs) and relevant country funds. However, there has also been a critical stance on information provided for example on some official websites that utilize references to a third party official data, such as "CEE Bank Watch"(Central and East Europe Bank Watch), and such information was compared and verified against its origin i.e. the referenced sources.

In order to get a good idea of the current situation and the latest updates of relevance related to the RES market in Republic of Serbia, publications from the following institutions were considered: Balkan Energy News, Energy Community of South Eastern Europe, Center for International Relations and Sustainable Development (CIRSID) "A Roadmap to Deploying RES in Serbia and Regional Perspective" (publishing year: 2015), RES technology company Websites, RES project developers Websites, the Non-Government Organization (NGO) "The institute for Green Economic Development", the Serbia's Energy Agency, etc. A crucial source was also greatly utilized, particularly for raw data from the Ministry of Energy's registry available online.

It is useful to say that all the utilized literature, with the exception of some factual literature on renewable energy, is the current literature spanning from 2011 to 2016. The aim was to have updated information on the topics as this is a very dynamic subject in general, particularly in respect to amendments to policies in Serbia as well as to numerous activities and project developments in the sector.

Majority of the literature is in English and in the Serbian language with some exceptions of the literature in the German language. With that, the quality of information allows to be further explored from different angles. It is crucial to mention that when obtained data was not verified as exact (i.e. numbers provided in example of unemployment, power generation size, etc.) this data was then compared with various sources and an approximate estimate has been proposed.

This thesis topic has been discussed in the region for the past several years however, not so much has been written about particular case of the Republic of Serbia. There have been multiple reports on "Deploying" renewables in the region and recommendations to investors. It is worth noting that most of the publications have been

issued to promote, to influence or to achieve specific goals by often taking a biased approach in presenting only the favorable facts. Almost none covered some reality aspects and critical society angles that have many practical implications including the people's standard of living that is somehow linked also to the RES market development. This is especially true in the case of underdeveloped countries or countries recovering from major regional conflicts followed by painful political and social transitions. Naturally, in this latter case, the country's priorities might significantly differ from priorities of the developed countries.

2 Methodology

This thesis can be classified as analytical, with applied research compilation that incorporates aspects of the “new market development” where example of Republic of Serbia is chosen as the specific business case. The practical and applied research aspect of the thesis includes empirical examples of projects, face to face interviews with RES market participants and extensive secondary research to identify the main factors which are of significance to the market development. The thesis is divided into four sections where each section addressed a different topics of the RES “journey” to market formation.

Not only due to my personal interest, but also for purpose of collecting the “real life data from the first hand” on the thesis topics, there have been four insightful interviews arranged with the several different RES market participants. These interviews contributed greatly to set a basis for further research and direction of the thesis.

The first section of the thesis titled “RES- Policy Driven Business Case”, offers a quasi-theoretical concept of RES including views of the RES development in the lesser developed countries. There, the policy role is covered, typical market development phases, as well as the main factors of RES market which make it unique in respect to regulative, technological and financing sectors. The inspiration for the thesis outline also stems from a study done by Daugbjerg, Carsten and Halpin, Darren (2010) 'Generating Policy Capacity in Emerging Green Industries: The Development of Organic Farming in Denmark and Australia', Journal of Environmental Policy & Planning. It especially provided terms on policy creation and different aspects involved in area of emerging green markets. The study reveals that three main driving factors need to exist for market birth and these are the state determination or commitment, interest groups and the good will in all of them for working towards agreements and cooperation. Accordingly, the good part of the thesis addresses these three main aspects of the RES development in Serbia.

The implementation and practical utilization of these RES market drivers in the lesser developed countries is challenging and goes in a slower pace. This finding along, with some additional and related facts, was supported through interviews with the sales representative of the large supplier of the RES equipment responsible for the East

Europe. These specific interviewee was selected due to his direct involvement in the local RES markets that are still, in some cases, in very early development phases. The interviewee shared some inputs also related to countries with even lesser developed RES markets than that of Republic of Serbia which was extremely helpful for my thesis. For example, I learned about the obstacles which exist in countries like Russia, Belarus, Kazakhstan, Ukraine and The Baltics, and how these obstacles, including financing, legislative, and technological are being addressed. Although, it was made clear to me that companies i.e. project developers/suppliers themselves are not directly addressing these obstacles, their communication with IFIs and development entities, their technology symposiums and conferences organized locally, as well as meetings with authoritative figures, play all a big role in conveying the obstacles towards resolutions and project completion. With that in mind, the focus of the thesis has been greatly on external/internal drivers such as IFIs and Development Fund's communication with legislative bodies, commercial banks, and other stakeholders involved, as well as their actions towards market development and elimination of barriers.

In order to further understand the critical role of the RES technologies, an interview was conducted with a technical director of the one of the largest RES equipment supplier firm in the world. The choice of this specific interviewee came from the fact that technology plays one of the key roles in the RES market development since it is the one of the critical components in making the RES competitive against the conventional energy markets. This was of great use for preliminary research progress as well as for initiating further research on some specific topics identified as important. This interview allowed me to grasp RES market, high level facts on technology and to comprehend the specifics of the RES industry evolution. Additionally, it helped me to comprehend the relative size of projects (i.e. what are the big/small projects in sense of MW) and what is their relation in terms of size when comparing to the conventional power plants, etc. Overall, the first section provides a general perspective which sets the base for the rest of the thesis in terms of the different key factors that need to be addressed for the case of The Republic of Serbia.

The next section of the thesis titled "Serbia - Internal factors affecting RES market", pays special attention to reviewing the policies as well as the internal drivers which are the key to the RES market appearance and ways in which the market is

growing in the Republic of Serbia. These analyses included: the legislative bodies and laws which pertain to the Energy market, the national priorities, the business environment and effects of transition, the potential of RES in the country, the current energy sector, the cost and benefits of the RES for Republic of Serbia as well as the risks associated with RES specific business perspective. The mentioned aspects and drivers of the RES market initiation were chosen based on the analysis of reports on the topic, including thorough analysis of Republic of Serbia's socioeconomic, political as well as the broader energy sector challenges.

Additionally, by conducting interviews with one of the leading power trade managers at Serbia's EMS (Elektro Mreze Srbije), which is a great stakeholder in the RES market development in Republic of Serbia, further attributes and internal drivers were revealed. The interview was an effective tool in gaining the understanding on the utility company's view point regarding the RES market development, the actual energy trends in the country, as well as to acquire insights on the Serbia's electricity market and different legislations which have impacted the market liberalization. Furthermore, the interviewee addressed aspects of Serbia's socioeconomic state and how the energy market is an important factor. Moreover, the interviewee presented aspects of the country's massive brain drain, difficulty to employ, grow and keep the local young engineers and inability for Serbian companies to be quickly adapted and involved in the RES market development. Also attributes and necessities for foreign investments were revealed as a vehicle for promoting the new industry, avenue for potential job creation and technology transfer that would benefit the country overall.

In order to fully understand the policies of the country, legislations were reviewed stemming from the relevant ministries, particularly the Ministry of Energy and Mining, but also by reviewing related laws which may play a role in RES sector such as the Law on Construction and Planning. By analyzing the laws and regulations pertaining to the Energy law in particular, key factors relating to the RES are highlighted. Aspects of the RES policy creation, that were in more details identified in the section "RES - a Policy Driven Business Case ", are compared to Serbia's respective energy law. Factors such as various risk mitigating aspects of policy capacity are also further analyzed and commented on. In order to get an idea of the development of the energy law and RES regulations (as it is an important aspect of answering the question

of how external/internal factors play a role in policy creation and market development), throughout the last years (mainly form 2009 up until June 2016), older laws and amendments to the laws are also further explored.

For the purpose of addressing the state willingness for the creation of the RES market, it was necessary to examine the national priorities set by the government for the inclusion in the World/European economic and political organizations. By reviewing the relevant national priorities, it was clear that Republic of Serbia is a country with goals oriented around sustainable economic development, including numerous mentions of energy sector improvement including the promotion of renewables. With this implication, a basis was set for further analysis of commitments of the Serbian government towards RES promotion. Secondly, the National Renewable Energy Action Plan (NREAP) was reviewed, in which the quota was set for the deployment of RES for 2020. The mentioned aspects were crucial for identifying the existence of the state willingness to allow for the further policy creation and creating an environment to attract investments in the RES sector. However, it was also necessary to understand the issues coming from the business environment challenges and obstacles in investment to the RES sector. The challenges of the country's business environment were highlighted, especially in the case of the RES, but it has also been identified that there also exist a number of benefits which are crucial for the country's role in attracting foreign investments, including RES investments.

The necessary analysis is presented concerning the technical potential which pertains to the RES market as well as the costs and benefits of the RES in the country. Analysis of risks in the RES sector is presented by comparing the theoretical risk in the RES against the Serbia's specific risk structure, based on numerous analysis from credible sources, including project developers and investors. All the mentioned aspects further set a basis for the notion that there are important internal drivers for the development of the RES sector however, the challenges exist in the both, general economic sphere as well as the RES domain itself.

In the third section of the thesis titled "Republic of Serbia: External Factors influencing RES development", crucial outside factors for the RES market development are analyzed. Normally, the external factors are attracted by internal decisions that

enable necessary instruments for them to play a great role in the RES market development. These external factors which were identified in this thesis as IFIs, and national development funds, are analyzed by observing the projects they have been and are involved and how they address the initially mentioned risks in the country. Developments of their influence is observed and commented on. It appears that the time frame of external factors influence on the RES sector in Republic of Serbia is intensified somewhere between 2011 up until present day (2016).

The fourth section offers a practical, and a combined view of the interest groups and legislative bodies in the promotion of the RES. In this part, focus is placed on analyzing the numerous projects which have been planned, currently in progress or are taking place in the last five years. As it soon became apparent that each sector of the RES is developing differently, it was necessary to divide the section into the four different RES segments.[3] It was often not clear why some projects were halted, so therefore it was necessary to perform further research and explore the topics in greater detail, including analysis of different stakeholders i.e. banks, suppliers, developers, civil society, ministries. Most likely not all projects were accounted for, but by reviewing the available and identified projects, interesting facts were highlighted and expanded upon with a high likelihood that the same facts and findings can be applied to the range of similar projects in general. It was also necessary to understand the different particularities of the different RES technologies, in order to come to turns to their specific needs towards project completion. The different RES sectors were compared to the legislations as well in terms of government incentives, and caps placed on the sectors, and how these aspects contribute to investment. Furthermore, it was beneficial to get more insights on the practical implementation of the RES projects development in Serbia, and therefore another interview was arranged. The interviewee was the sales representative of the Wind Turbine supplier company with responsibility for the Western Balkans, including Republic of Serbia. The questions addressed were mainly having to do with developments of the wind market, including the obstacles that wind farm developers and the investors face. The interviewee provided me with a much more practical and first hand understanding of the constraints, including constraints in the legislative, technological and financial spectrum. It was quite surprising that only a

[3] the main RES sectors referred to in this thesis are: PV, Wind, SHPP and Biomass/gas

small wind farm project was completed so far (despite increasingly more investor interest) and it was apparent that major barriers exist in this industry that come mostly from the mismatch between the "SAY" and "DO" factor applied on to the country's policies and processes. Interestingly, I learned also about the new amendment to the energy law which was recently (only days prior to the interview) adapted, and which is expected to contribute positively towards the RES market (particularly wind market) development.

Throughout the significant part of the thesis, crucial theoretical basis was formed defining the components of RES investments in general as well as the new market development (greenmarket) phases are recognized. Overall, by analyzing reports on Green Market developments, such as that of RES, it has been concluded that there are three main components which need to be addressed particularly in terms of policy creation and these are: the state's sincere commitment, the presence of interest groups and civil society, and finally, the participation and collaboration of the all in the policy establishment. Without these three key aspects the development of the said market would fail to exist. This is the basis on which this thesis was predominantly based upon. It was crucial to identify the specifics of Republic of Serbia, which has been revealed as a country suffering from tough economic and socio economic changes, but also a country willing to become a part of European economic and political organizations. RES is presented as a market which is not free from political influence, contrary, it is the market that is heavily dependent on political orientation. Therefore, we come to observe the significance of political inclination towards the establishment of this market. This political and economic spectrum is further observed when analyzing the various IFIs and national development funds which are highly responsible for the mitigation of risks, and the promotion of RES investments in the country. The mentioned external factors play a significant role, but they are also institutions which are obliged to follow a political agenda, particularly in terms of what, where and how they chose to finance projects. The interest groups are investors, but also development funds, as well as international and European organizations which are addressed and analyzed in further establishment of particular markets which are aligned to their political ideology.

3 RES - Policy Driven Business Case

Renewable energy[4] is a policy driven industry which, in the case of The Republic of Serbia, highly relies on external and internal factors for its development. Due to the industry specific characteristics, such as the high demand of upfront capital investment, the RES is also an industry which requires special attention in the three main aspects which are mainly: policy, technology and financing.[5] Although the RES technology cost is steadily decreasing[6], the sector is still nonetheless relatively new[7] and often the related capital expenditure (CAPEX) can be rather cost intensive. Additionally, the features of underdeveloped countries often attribute to an even more difficult environment for the RES investments comparing to developed countries. These aspects, further increase costs of the RES deployment, and therefore policy and risk mitigation act as an undeniable driver for implementation of the RES sector.

Despite of some deficiencies, renewables became competitive for various reasons. One of the key ones is the global initiative for climate change (Paris 2015 Agreement on Climate Change). [8] As a result of the global trend on climate change, 195 countries worldwide have adopted policies for zero net emissions.[9] Also these countries have adopted strategies for the implementation of renewable energy production in line with the zero net emissions policies. Particularly impactful policies are the contributing feed-in tariffs, as well as the purchasing power agreements (PPA), which have been specifically identified in developing and emerging economies.[10]

Renewable energy is currently the main source of the newly installed power generation capacities worldwide. From 2005 to 2015 the world has increased its

[4] In this thesis renewable energy is addressed as clean, cost free and continuously rechargeable by the nature. However, renewable energy is highly volatile and can be utilized only when available (wind blows in a predominantly random way, sun rises and sets down periodically, etc.). There are various renewable resources among which the solar, wind, hydro and biomass/gas are most interesting. (Clearinghouse, Renewable Energy: and Overview, March 2001, National Renewable Energy Laboratory, USA)
[5] Personal Expert Interview "Technical Director" at equipment provider firm, February 2016
[6] Personal Expert Interview "Technical Director" at equipment provider firm, February 2016
[7] since c.a. 2000 RES became widespread, incentives showed up and advancements in technology allowed for bigger scale units to be produced" Personal Expert Interview "Technical Director" at equipment provider company , May 2016
[8] United Nations, Framework Convention on Climate Change, December 2015, Paris, "Adoption of the Paris Agreement", https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf, date accessed: May 2016
[9] Personal Interview, Marketing Department of equipment provider, May 2016
[10] Department of Commerce of United States, "2016 Top Markets Report, Renewable Energy, A Market Assessment tool for US Exporters" April 2016

production of energy through renewables by 1,000 GW(According to 2016 report by the Department of Commerce of the United states). [11] In Europe, particularly in developed countries, renewable energy has accounted for 79.1% of all new power capacities. [12] However, in emerging or developing countries, the chief source of power generation is still from fossil fuel which is mainly coal lignite. Currently, 70% of Europe's total power generation is derived from the fossil fuel and 20% from the renewable energy sources.[13]

As mentioned previously, the RES industry is developing in all spectrums in which policy, financing and technology are the three main components for the efficient development of this new market. In emerging markets in particular, the development of the sector takes time and different methods are used to develop this new market and to contribute to the overall goal of increasing power generation from sustainable sources, by increasing investments and promoting efficient energy practices.

3.1 Preferential Policies

According to the International Energy Agency,[14] the development of the renewable energy market depends on a number of different aspects which differ from country to country. RES market development is a "journey" and takes the form of an evolution of policies and amendments which are a typically step-by-step process. [15]

Renewable energy investments inscribe three different crucial and unavoidable sectors. Firstly, the investments need to be addressed through: regulatory framework then project financing, and finally the technical standpoint.[16] However, without appropriate policy implementation, investments are unlikely to succeed.

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[11] Department of Commerce of United States, "2016 Top Markets Report, Renewable Energy, A Market Assessment tool for US Exporters" April 2016
[12] Center for International Relations and Sustainable Development (CISRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective pp.17
[13] Ibid.
[14] IEA, (International Energy Agency), Information Paper: "Policy Consideration for Deploying Renewables", 2011, Mueller, Brown, Oelz pdf.
[15] Ibid.
[16] APS, (American Physical Society), "Integrating Renewable Electricity on Grid", A Report by the APS Panel on Public Affairs, https://www.aps.org/policy/reports/popa-reports/upload/integratingelec.pdf, date accessed: May 2016

According to a studied conducted by Daugbjerg and Halpin[17] in respect to policy formation of emerging green markets there are three main aspects which need to be considered; the state capacity which affirms that the state must possess capacity for policy expertise, professional staffing, and organization, in which is also important that the state has the willingness to engage in the policy development. The second aspect of the policy development is the associative capacity, which involves interest groups under which business and the civil society play a role in policy formation. Thirdly, the corporate aspect is necessary, and in this aspect the state and the various interest groups participate in the policy dialogue and finally the policy creation.[18] In the other words, there are needs not only for the state interest in the policy but also in the market development, and not only for the business and the civil society interest, but also for the cooperative interest for creation of appropriate policies in the new emerging "green" markets.

The international energy agency offers a different angle on the "green market" or rather the RES market deployment by stressing needs for the different phases involved. Firstly, it should start with market initiation, which could be the establishment of strategic national goals for achieving the RES target. Secondly, the "market takeoff phase",[19] is to follow under which a steady increase in renewable energy sources is deployed. In this phase, a series of secondary policies should be in place to define the RES and the necessary aspects of its development. These are needed for the specifics of construction of such plants including land use, building permit acquirements, as well as technical and interconnectivity regulations. Finally, in the consolidation phase, aspects of the RES integration are to be addressed, among which are the power grid interconnection permits and power production.[20] In the last phase, communication with the appropriate utility companies and utility providers needs to be established and consolidated.

As mentioned, policy deployment differs from country to country, as every country has a differing economic sector as well as differing technological developments

[17] Daugbjerg, Carsten and Halpin, Darren(2010) 'Generating Policy Capacity in Emerging Green Industries: The Development of Organic Farming in Denmark and Australia', Journal of Environmental Policy & Planning, 12: 2, 141 — 157

[18] ibid.
[19] IEA, (International Energy Agency), Information Paper: "Policy Consideration for Deploying Renewables", 2011, Mueller, Brown, Oelz pdf.
[20] Ibid.

but also a contrasting market size. Policy packages should therefore, take in to consideration these aspects, in order to appropriately address challenges and mitigate risks. It is also crucial to consider the evolving process of the RES market development, and the necessary policy changes which need to take place over time. Therefore, policy is constantly updated attribute in the insufficiently developed markets.[21]

3.2 Risk Mitigation

As the risk of the RES investments is considered far greater in developing countries, and or countries which have not yet developed their renewable energy markets, the UNDP has identified three main ways to mitigate risks, in which policy, financing and direct finance incentives are found to be key. Firstly, it is crucial to understand the risks involved in the certain country, and then to address them appropriately.

Policy risk is the base cause of other risks involved. [22] Such risks are associated with policies which do not apparently support renewable energy development. A common and perhaps obvious way of de-risking such aspects is through the adoption of renewable energy supportive policies, such as ones made through renewable energy policy designs or national strategies on the renewable energy.[23] However, this also includes the confrontation of other stakeholders involved, in which the utility companies and relevant ministries could be considered by addressing their policies in order to favor the RES investments.

One of the main aspect of renewables, particularly of renewables in developing countries is the high financing costs. Therefore, it is the issue which is to be considered in order to decrease financial cost as well as to promote renewables. The applied and broadly utilized metric is called the "LCOE" or the levelized cost of energy. The metric allows for a "like for like" comparison of the "life cycle generation cost" of different

[21] IEA, (International Energy Agency), Information Paper: "Policy Consideration for Deploying Renewables", 2011, Mueller, Brown, Oelz pdf.
[22] UNDP: "Derisking Renewable Energy Investment", A frame work to support policy makers in selecting public instruments to promote renewable energy investment in developing countries, 2013, pdf.
[23] ibid.

technologies. Through this metric, a more competitive aspect of renewable energy sources is proposed, compared with TPP. [24]

Although the costs of the RES technology are in general steadily decreasing[25], in developing countries it is still unlikely to happen, as financing is still quite costly and long term financing is still an issue. [26] In many cases, investors and or developers face barriers with *financing* their projects, as obtainment of large sums of upfront capital is usually not yet readily available. In such cases, banks may offer short term loans, with a loan tenor equaling to half or less of the projects foreseen lifetime value. Moreover, equity contribution tends to be higher for higher risk loans.[27] In order to mitigate *financing risks*, policies can transfer the risk of private institutions to public factors, international financial institutions (IFIs) or development funds. [28]

As the RES projects are exposed to different kinds of risks throughout their lifecycle, it makes them even more complicated to finance.[29] Therefore, some ways the risk can be managed is by addressing the potential project risks that exist in the different phases of the project development. For instance, *direct financial incentives* can be offered for the RES projects to further de-risk projects and to provide an inviting environment for private investors and private power producers.[30] These financial incentives often take form of the PPAs (Purchasing Power Agreements), which offer long-term price for power, as well as the guaranteed access to the power grid.[31]

For the risks involved with planning and permitting projects, there could be issues involving the local communities, ownership rights etc. For this aspect, it is most certainly necessary to address all stakeholders involved, including the local community

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[24] EIA, US Energy Information Administration, "Levelized Cost and Levelized avoided cost of New Generation Resources in the Annual Energy Outlook 2015" ,June 2015, https://www.eia.gov/forecasts/aeo/electricity_generation.cfm, date accessed: April 2016
[25] Department of Commerce of United States, "2016 Top Markets Report, Renewable Energy, A Market Assessment tool for US Exporters" April 2016
[26] ibid.
[27] UNDP: "De-risking Renewable Energy Investment", A frame work to support policy makers in selecting public instruments to promote renewable energy investment in developing countries, 2013, pdf.
[28] Ibid.
[29] Re Focus (2005): Financing RE-Risk management in financing Renewable Energy Projects, www.re-focus.net date accessed: July 2016
[30] UNDP: "De-risking Renewable Energy Investment", A frame work to support policy makers in selecting public instruments to promote renewable energy investment in developing countries, 2013, pdf.
[31] ibid.

and to have local partners involved in the project.[32] As previously mentioned, the risks involved with projects in the lesser developed countries is far greater, nonetheless, with appropriate policies, as well as communication between interest groups, local communities and governments, projects have more of a chance of success.

3.3 Section Summary

The Renewable Energy industry is one with many particularities and exceptions. The uniqueness of renewable energy is in the newness of its technology, its continuous development and innovation and growing need for introducing supporting markets involving variety of related ancillary services (example: energy storage market, etc.). As a global movement towards more sustainable energy usage, the renewable energy sector has gained quite a great deal of support from various governments worldwide. However, since renewable energy is still in many countries considered as fairly new source, there is a need to completely develop certain regulatory, financial and technological bodies in order to cater to the appropriate development of the market. Particularly, in the developing world, the need to establish new policies as well as the need to address specific requirements which directly affect renewable energy investments is increasingly ever so present. Risk in the developing nations is higher for renewable energy investments chiefly due to the fact that there it is a new industry with unavailable financing arena, due to a lack of policies, as well as an insufficient technological spectrum including inadequacy of power network infrastructure or inadequate energy market. Overall, there is a great need for development funds and banks to take on the risks that are far too high for private institutions. Furthermore, policies need to be established in which they grasp the risks involved and act in a manner to address the obstacles and further allow for an attractive investment climate.

[32] Re Focus (2005) : Financing RE-Risk management in financing Renewable Energy Projects, www.re-focus.net date accessed: July 2016

4 The Republic of Serbia – Internal Factors Affecting RES Market

The new market deployment in transitional countries calls for addressing the additional challenges or deficiencies which may not exist in developed countries. For such a reason this section highlights the main features of the country in "transition" such as is the Republic of Serbia and provides related background and factors that have an impact on the RES market development.

The Republic of Serbia is a land locked country located in central and southeastern Europe. It is situated on the Pannonia Plain and the central Balkan region with approximate population of 7.1 million of people. It is located in the transit area between the East and the West.[33] The current (2014) GDP/capita is around € 4,646 and the GDP around € 33.059 billion. The real GDP growth rate for 2014 was -1.8% and in 2015 it is expected to increase to about 0.8%.[34] The World Bank characterizes Serbia as the "upper middle income economy" [35] and as the "efficiency driven economy" in the transition phase.[36]

Serbia is a country with many challenging aspects of its damaged economy especially due to relatively recent regional conflicts followed by hard economic sanctions. Complicated history as well as the challenges caused by recent political transitions also contributed to endeavors of key participants in the development and the configuration of today's business environment in the country.

However, todays' government rule is chiefly oriented around certain goals which dictate its economic, and political priorities. These particular priorities also greatly influence the energy sector. By evaluating the country's current energy sector, it can be observed that an energy transformation is needed. Furthermore, the political goals of the country further support the development of the RES and sustainable energy markets the country. The RES market could bring new potential to the country, and aid in sustainable development of its energy sphere but also aid in addressing certain economic and socioeconomic deficiencies which are quite apparent.

[33] The "West" in this thesis refers to the developed European countries and the "East" refers to the region of post-Soviet Union countries
[34] World Bank, Serbia, Global Economic Prospects, Annual GDP growth rate, http://data.World Bank.org/country/serbia#cp_wdi
[35] World Economic Forum, Serbia, 2015, Global Competitiveness Index, http://reports.weforum.org/global-competitiveness-report-2014-2015/economies/#economy=SRB
[36] World Bank, Serbia, http://data.World Bank.org/country/serbia#cp_wdi

4.1 National Priorities of Government of Serbia

The Government of The Republic of Serbia has as of 2008 declared national priorities for sustainable development in which the following are central:[37]

- "Membership in the European Union", in which is included the coordination with EU including all obligations and legislations
- "Development of the competitive market economy", in which is included the enhancement of FDI conditions, as well as finalization of the started privatization process. Moreover, stress is placed on the improvement of energy efficiency, and sustainable energy promotion.
- "The development of human resources", including the increase in employment, hampering brain drain, investing in knowledge market and development of human resources.
- "Development of infrastructure and balanced regional development", in which is included development of sustainable energy infrastructure, and regional development in underdeveloped regions
- "Protection and improvement of environment and the rational use of natural resources", in which is included the integration of a sustainable environmental policy in various sectors of expansion, more efficient use of fossil fuels, as well as a more efficient use of energy, promotion of sustainable renewable energy sources.[38]

Under the national priorities, energy, energy efficiency, renewable energy promotion, FDI promotion, employment and sustainable environmental policies are found to be the core as well as reoccurring topics. The mentioned government priorities are said to pave a path for the matters of international assistance, as well as to dictate the process of further privatization, as well as the strategies and manners of foreign investments.

[37] NSDS-pursuant to Article 17 paragraph 1 and Article 45 paragraph 1 of the Law on Government ("Official Gazette RS" Nr.55/05, No.71/05-amendment and No.101/07) http://www.odrzivi-razvoj.sr.gov.yu/assets/download/Sustainable-Development-Strategy-of-the-Republic-of-Serbia.pdf , date accessed February 2016

[38] United Nations,(2010) UN Country Partnership Strategy , Republic of Serbia, 2011-2015, UN ftp://ftp.fao.org/TC/CPF/NMTPF/Country%20NMTPF/Serbia/Serbia%20Signed_UNDAF_English.pdf, date accessed: March 2016

4.2 Strong Impact of Political Transition on Business Environment

Serbia is a country still going through political transition. The transition process in the country differs greatly from that of other formerly planned economies from east and central Europe.[39] The effects of the war and global economic exclusion during the 1990s, are still contributing to the current economic and social state. Serbia's current political and economic weakness makes a country vulnerable to external influences that further shapes the country's and government's objectives on attracting foreign investments and foreign capital.[40]

The current and recent administrations have been active in creating favorable conditions for foreign investors. One of such incentives established for attracting the investors, particularly foreign ones is the lowest corporate tax rate in Europe (10%).[41] Moreover, the current government offers somewhere between € 2,000 to € 10,000 incentives paid to foreign investors for creating each new job in a specific fields such as research and development, production and services.[42] Furthermore, corporate profit tax relieves are offered for a span of ten years, under which eligible companies are not required to pay profit tax.[43] Additionally, double taxation treaties exist with a number of countries, and eligible investors can avoid double taxation if the treaty exists with the certain country.[44] In summary, it can be stated that Serbia currently has a very friendly tax regime for foreign firms which might not be actually the best solution for the struggling Serbia's economy.

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[39] Serbia's – formerly SFR Yugoslavia's transition path was already marked in the 1970s with a system of "market socialism". The lag in Serbia's transition today is caused by 1990s wars and transition was "restarted" in 2000 with the formation of a new country (October Revolution 2000) and political party-includes reestablishment of "western" diplomatic and economic relations with Serbia –at the time Yugoslavia, (Estrin, Saul: Journal of Economic Perspectives—Volume5, Number 4—Fall 1991—Pages 187–1 and IMF:2016. Republic of Serbia and the IMF: http://www.imf.org/external/country/SRB/, date accessed June 2016)

[40] LSEE: Nov.2014: "Changing Global Business Trends and Serbia's Obsolete Strategy for attracting foreign investment", http://blogs.lse.ac.uk/lsee/2014/11/11/changing-global-business-trends-and-serbias-obsolete-strategy-for-attracting-foreign-investment/, date accessed May 2016

[41] Santander: Serbia: Foreign Investment (2016), https://en.portal.santandertrade.com/establish-overseas/serbia/investing, July 2016

[42] RAS Development Agency: Financial Benefits and Incentives (2016), http://ras.gov.rs/invest-in-serbia/why-serbia/financial-benefits-and-incentives, date accessed: July 2016

[43] Ministry of Finance of Republic of Serbia, RS Official Gazette, Nos. 25/2001, 80/2002, 43/2003, 84/2004, 18/2010, : Corporate Profit Tax Law, http://www.mfin.gov.rs/UserFiles/File/english/Corporate%20Profit%20Tax%20Law.pdf, date accessed: July 2016

[44] Invest in Serbia: Business and Investing in Serbia,2016, http://www.investinserbia.biz/ieoc.php, date accessed: July 2016

Other features of Serbia's transition which have dictated the nature of its business environment, are aspects of human capital. Firstly, unemployment in the country has been a constant battle. The latest statistics on unemployment are from 2015, fourth quarter, when the unemployment number was 17.9%. However, in 2014 this number was 20.16%[45] (although these numbers slightly differ from various sources). The most troubling aspect is actually the youth unemployment. According to the Serbia's statistical office, youth unemployment in the country is as high as 49.4%.[46] Furthermore, Serbia's work force is an interesting and perhaps contradicting one. Although the country has had a tradition of highly skilled workforce, particularly in the SFR Yugoslavia[47], the human capital index of today is relatively low.[48] According to the Global Competitiveness index[49], Serbia ranks extremely low in terms of retaining of talent as well as the talent attraction and investment in the research and development.[50] In fact, Serbia ranks lowest out of any of the surveyed countries in terms of talent retaining and it is the second to lowest in terms of attracting the talent.[51] Some of reasons for this is also that the wages of professionals are relatively low and there is not enough "good" job opportunities. The average net salary in the country is about € 360/month (2015).[52] This is one of the lowest net salaries in Europe, and even in the region. For instance for the comparison, the highest average wage in 2015 in the countries of the former Yugoslavia was in Slovenia, € 1,004, while the lowest wage of € 361 was recorded in Serbia.[53]

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[45] UNDP Serbia, About Serbia, http://www.rs.undp.org/content/serbia/en/home/countryinfo.html
[46] Republicki Zavod za Statistiku, Podaci, Srbija, http://webrzs.stat.gov.rs/WebSite/Public/PageView.aspx?pKey=2
[47] I. Baucic, The Effects of Emigration from Yugoslavia and the Problems of Returning Emigrant Workers, Volume 2 of European Demographic Monographs, Springer Science & Business Media, 2012
[48] WEF: Human Capital Index 2015 Report: http://www3.weforum.org/docs/WEF_Human_Capital_Report_2015.pdf, date accessed: July 2016
[49] The Global Competitiveness index is a method of evaluating the strength of an economy, taking in factors such as the strength of the country's institutions, infrastructure, macroeconomic environment, health and primary education, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation. [49] The global competitiveness index, assesses 140 economies worldwide. Serbia ranks 94. Out of 140 countries, for the 2015-2016 index
[50] World Economic Forum, Global competitiveness index, pillars, Serbia, http://reports.weforum.org/global-competitiveness-report-2015-2016/economies/#indexId=GCI&economy=SRB
[51] Ibid.
[52] Serbian Investment and Export Promotion Agency, Invest Serbia Info Pack 2015, SIEPA.gov.rs date accessed march 2016
[53] Turkish Weekly, Serbia has the lowest average wage in the Balkans, M.Mitrovic, Jan.2016, http://www.turkishweekly.net/2016/01/09/news/serbia-has-the-lowest-average-wage-in-the-balkans/ date accessed march 2016

This aspect can be either positive or negative from the investor perspective. In terms of increased RES activity there is a potential for Serbia's brain drain to be partly halted and for unemployment to be decreased. This aspect can be observed through the employment of local engineers, the consultancy firms and related services which is often advantageous for the RES project developers. This is due to the fact that the local engineering resources may have a deeper knowledge of the local institutions, procedures, technical standards and can contribute greatly through the cultural and language advantages. Creation of new local jobs related to the RES projects could also be of benefit to improve Serbia's socioeconomic challenges, can contribute to the country's reduction of the "brain loss" and in turn, can help in introducing new technological development in the respective fields and the universities.

Since the 1990s, Serbia has been suffering from significant corruption levels, which also have a presence in its business environment. For instance, bribery is quite common, particularly in the energy sector. According to CEE Bank watch study, in 6.6% of business cases bribery is apparent, out of which 8.8% (the highest) affect the manufacturing, electricity, gas and water supply sectors. [54] Corruption prevalence in the energy sector[55] is widespread in the country particularly in the tendering process of new projects, as well as in the overseeing of investments.[56] Furthermore, the transparency of the law adaptation is not always apparent.[57] Therefore, the new law adoption as well existing law amendments are not always clearly portrayed and overseeing of the policy regulation is a challenge.

Doing business in the country is often considered as a task that can be challenging, that should involve careful planning paying attention to all the steps including management of the "obstacles". According to the World Banks ease of Doing

[54] ibid.
[55] Balkan Insight, The Dark Side of Energy Deals in the Balkans, "Corruption hinders Balkans Energy Sector Progress" (2014), http://www.balkaninsight.com/en/article/corruption-hinders-balkans-sustainable-energy-future
[56] taken from : Bank watch, Corruption: Serious barrier to sustainable energy system in South eatern Europe, June 2014, http://bankwatch.org/news-media/for-journalists/press-releases/corruption-serious-barrier-sustainable-energy-system-south **Garret Tankosić-Kelly**, principal of SEE Change Net, speaking ahead of the panel
[57] Center for International Relations and Sustainable Development (CISRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective, pp. 28

Business Report for 2016, Serbia ranks 59th out of 189 countries.[58] Specific issues which place the Republic of Serbia quite low on the ease of doing business report are also the amount of time needed for the enforcement of contracts. In Serbia, 635 days are needed for the enforcement of the contracts, which is particularly high and therefore costly to investors. Another issue which is relevant for the RES producers in particular, is the obtainment of construction permits. According to the same report, in 2015 Serbia ranked 178/189 countries on the obtainment of construction permits, however by 2016, the rank has improved, to 139th/189 countries.[59] The improved rating could be stemming from the governments adoption of a new law on planning and construction, which has further clarified the old law.[60]

Issues with financing investments also remain a challenge. This is mainly due as Serbia is ranked pretty high in terms of financing risk. This aspect is contributed by the country's "financial soundness factor", where the country ranks quite low. Heavy reliance on foreign capital and complex financing characteristics further increase the risk of capital interest in investments in the country. The main forms of financing in Serbia are from external bonds and loans, as opposed to domestic banks and or government deposits.[61] Additionally, problematic indicators can be observed with the country's non- performing loans (NPL), as they are among the highest in Europe, including more than 100% provisions to gross NPL. [62]

In general terms (according to the World Bank), the main obstacles in Serbia for doing business are the following: currency fluctuations, complicated tax laws, frequent changes in in laws and regulations, political instability and corruption.[63] The issues which effect the business environment and which are particularly prevalent in the energy sector are issues of corruption. However, the business environment for the

[58] World Bank Group, Doing Business 2016, http://www.doingbusiness.org/data/exploreeconomies/serbia, accessed : June 2016
[59] World Bank Group, Doing Business 2016, http://www.doingbusiness.org/data/exploreeconomies/serbia, accessed : June 2016
[60] Ministry of construction, transport, and infrastructure of Republic of Serbia, 2014,"Draft Law on Amendments to the Law on Planning and Construction, http://www.mgsi.gov.rs, date accessed: June 2016
[61] IMF, Republic of Serbia, table 5a: General Government Fiscal Operations, 2012-2017, Ministry of Finance and IMF, https://www.imf.org/external/pubs/ft/scr/2015/cr1550.pdf
[62] IMF, Republic of Serbia, Figure 11, Financial Soundness Indicators, 2008,2013, https://www.imf.org/external/pubs/ft/scr/2015/cr1550.pdf
[63] UNODC, Business, Corruption and Crime in Serbia, 2013, the impact of bribery and other crime on private enterprises, Vienna, 2013, United Nations Survey and Statistics Section

renewable energy sector faces certain particularities, some of which are acting in its favor. For instance, the political orientation of the government is in favor of the RES sector. Due to various reasons such as the current government in power's orientation towards the EU[64], the political instability in this area is considered far less harmful. Although the changes in laws are continually transforming, they have been increasingly in the favor of the RES development. According to the IMF the top priorities or challenges in the reformation process are characterized by insufficient institutions, infrastructure, and goods market inefficiency.[65]

It can be assumed, that although the government's focus is on attracting investments and foreign capital by creating favorable tax regimes and other incentives, there still exist obstacles and constraints, which are the effects of the past socioeconomic and political conflicts. These conditions, although present in all forms of foreign direct investments (FDI), as well as general business environment, are even more so apparent in the RES sector. Nonetheless, investors are interested in Serbia as a country of investment as investors observe considerable potential in its (so far almost untapped) RES sector.

4.3 Renewable Energy Potential

The Republic of Serbia is a country with a considerable renewable energy source potential. According to Serbia's Ministry of Energy and Environmental Protection, 4.30 MTOE of renewable energy potential exists in the country.[66] As claimed by further studies, Serbia's total technical potential for renewable sources of energy are the following: 62% from biomass (3.3 MTOE), 17% solar (0.6 MTOE), 10% small hydro power plants (0.4 MTOE), 5% geothermal, and 6% from wind (0.2 MTOE).[67] Other studies show similar results. [68] As it can be observed, biomass seems to have the most

[64] Financial Times, "Ruling Progressive Party Claims Serbia Victory", (April 2016), https://next.ft.com/content/78f37810-0a1e-11e6-b0f1-61f222853ff3, date accessed July 2016
[65] IMF: Regional Economic Issues Special Report: The Western Balkans, 15 years of Economic Transition, March, 2015, Global Competitiveness Index, Top 5 Reform Priorities for each State
[66] SIEPA, Renewable Energy Sector Highlights, Serbian Ministry of Energy and Environment Protection, http://siepa.gov.rs/en/index-en/key-industries/renewable-energy.html, date accessed: April 2016
[67] SYMORG, 2014, Zlatibor, XIV International Symposium, New `Business Model and Sustainable Competitiveness pp. 1589
[68] Energy Community, 2010, Investing in Energy Efficiency and Renewable Energy, Vienna, Investing in Renewable Energy Sources in Serbia

technical potential in the country. However, the widely untapped potential of the other sectors also offers for a considerable investment opportunity.

There are currently a number of "preliminary privileged power producers" (P-PPP), as well as slight installed capacities of RES, which will be discussed in further detail in the last chapter of this thesis.

4.4 Current Energy Sector in Serbia

The Republic of Serbia's current energy sector is characterized by aspects which undeniably signify the need for transformation and improvement. Aspects of its energy sector development in the last years however, also denote that the sector is changing together with the country's political and economic transformations.

Serbia is currently a net importer of electricity, and it has been for almost two decades.[69] The RES sector development is hoping to improve this aspect of Serbia's electricity market as potential does exist in the country. Furthermore, as of 2015, the respective market is completely liberalized and open to all customers.[70] Therefore, competition in the Serbia's power sector is enabled and on the way. The Republic of Serbia has one of the lowest household and industrial electricity prices in Europe.[71] [72] This is mainly due to the large government subsidies on the state owned electric company (EPS), with regulated prices by the Energy Agency of the Republic of Serbia (AERS).[73] In fact, Serbia is amongst the top ten countries in the world with highest percentage of energy subsidies in the gross domestic product.[74] This is a further aspect

[69] World Bank, "Serbia, Energy imports, (net % of energy)", http://data.World Bank.org/indicator/EG.IMP.CONS.ZS, date accessed: March 2016
[70] Balkan Energy News, Country Report on Energy Business Serbia, 2014, www.balkanenergy.com, date accessed: April 2016
[71] Eurostat, File: Electricity prices for household consumers, second half 2014, http://ec.europa.eu/eurostat/statisticsexplained/index.php/File:Electricity_prices_for_household_consumers,_second_half_2014_%28%C2%B9%29_%28EUR_per_kWh%29_YB15.png, date accessed: april 2016
[72] Eurostat, File: Electricity prices for industrial consumer second half 2014, http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Electricity_prices_for_industrial_consumers,_second_half_2014_%28%C2%B9%29_%28EUR_per_kWh%29_YB15.png, date accessed: April 2016
[73] Balkan Energy News, Country Report on Energy Business Serbia, 2014, www.balkanenergy.com, date accessed: April 2016
[74] UNECE, Energy Sector in the Republic of Serbia, Coal and Electricity, Ministry of Mining and Energy (2013), http://www.unece.org/fileadmin/DAM/energy/se/pp/clep/ge11_ws_oct.2015/13_M.Djakonovic.pdf, date accessed: April 2016

of a tough socioeconomic state since an increase in electricity prices could cause great issues and turbulence within the civil society.[75]

Despite the market liberalization, acquiring electricity can often be considered a difficult task. There are still (as of 2016) no privately owned generation capacities that can sell on the open market, energy can still only be obtained through the EMS trading company.[76] The EPS has a share in 100% of all large generating capacities, and 99% of all generation of electricity.[77] This further implies the aspect that although The Republic of Serbia has an open energy market, the monopoly of EPS/EMS is still a factor in the field.

Furthermore, Serbia's power generating capacity units are largely characterized by rather old and ill invested plants. In fact, Serbia's power generating units are on average older than 20 years, some 35 to 40 years of age.[78] The further characteristic of the country's power generation units is that they have also experienced a lack or minimal investments in the new projects or upgrades over the few decades. The lack of investments over the years have contributed in a negative manner to Serbia's power production, which further supports the aspect as to why Serbia is a net importer of electricity since 1996.[79]

Additionally, it is crucial to consider the importance of Serbia's location in terms of energy trade. Serbia is strategically located in a region which is a transit way between many regions, as well as the fact that it is a country bordering eight other nations, and it is often considered as a trading hub. This can be quite apparent when observing the numerous trading companies (78) from various countries in the world.[80]

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[75] Brnabic, Ana, "Serbian Energy and Climate Policy: A Critical Perspective", (2008), http://www.sogde.org/wp-content/uploads/2015/09/brnabic_20_02_15.pdf, date accessed: May 2016
[76] Energy Agency of the Republic of Serbia (AERS), "electricity market" (2015), http://www.aers.rs/Index.asp?l=2&a=41&tp=TEEE, date accessed May 2016
[77] Ibid.
[78] Balkan Energy News, 2014, Country Report on Energy Business
[79] UNECE, Energy Sector in the Republic of Serbia, Coal and Electricity, Ministry of Mining and Energy (2013), http://www.unece.org/fileadmin/DAM/energy/se/pp/clep/ge11_ws_oct.2015/13_M.Djakonovic.pdf, date accessed: April 2016
[80] Energy Agency of the Republic of Serbia (AERS), "electricity market" (2015), http://www.aers.rs/Index.asp?l=2&a=41&tp=TEEE, date accessed May 2016

The energy mix in Republic of Serbia is far less diverse when compared against some other Western Balkan states.[81] In fact, coal is still the prevailing source of energy production with 53% of domestic inland energy consumption deriving from the coal lignite source. [82] Moreover, in terms of electricity generation, conventional thermal energy production accounts for about 67.1% of production and hydroelectric for 32.9%. [83] Serbian electricity generation is mainly based on thermal plants, with participation of some 60% to 70% of total generated capacity. Serbia's carbon intensity per GDP is more than ten times greater than the OECD average[84]. On the other hand, nuclear energy was not permissible in the country due to a signed moratorium after the Chernobyl incident.[85] However, this moratorium has expired in 2015.[86] Therefore, future projects involving nuclear energy could be plausible, despite the mentioned government priorities and obligations to EU. The overall state of Serbia's power generation is not in a favorable agreement with the actual national priorities as well as the sustainable development of Serbia's energy market. This further exemplifies the need for diversification in the energy sector, preferably towards the Green Energy market. [87]

Energy usage is extremely inefficient in the country. The reason for significant energy inefficiency in the country is mainly due to the buildings age, which were built in the 1970s and 1980s without thermal isolation, amongst few other factors. This has in turn resulted with Serbia's primary energy consumption (per every unit of GDP) to be very high, in fact it is 13 times higher than in Germany and some 10 times higher than in France.[88]

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[81] International Energy Agency (IEA), "The Energy in the Western Balkans; The Path to Reform and Reconstruction", UNDP, (2008) http://www.iea.org/publications/freepublications/publication/balkans2008.pdf, date accessed April 2016

[82] Energy Community, Shares of Fuel in Gross Inland Production (2013) https://www.energy-community.org/portal/page/portal/ENC_HOME/ENERGY_COMMUNITY/Overview date accessed: April 2016

[83] World Energy, Serbia, diversity of electricity generation, (2013) http://www.worldenergy.org/data/trilemma-index/country/serbia/2013/ date accessed: April 2016

[84] Karagosta, C., Flouri, M., Dimopoulou, S. and J. Psarras, 2012: Analysis of renewable energy progress in the Western Balkan countries: Bosnia–Herzegovina and Serbia. In: Renewable and Sustainable Energy Reviews, 16: 5166-5175

[85] UN: Ministry of Energy and Mining, : National Reporting Guidelines for CSD-Thematic Areas, Energy, "Law on Prohibition of Nuclear Power Plants"

[86] Jankovic, Popovic, Mitic, 2015, "Energy Sector Serbia", - Law on Prohibition of Nuclear Power Plants", http://www.jpm.rs/wp-content/uploads/2016/01/Energy-Sector-Serbia.pdf, June 2016

[87] UNDP, Serbia, Renewable Energy Snapshot, Key information about renewable energy, Serbia

[88] GEF: Project Identification Form, Project description, IMF 2013

In the renewable energy sector, Serbia is still lagging behind. In 2012, 36.184 GWh of electricity was produced by the Privileged power producers (PPPs). In 2012 renewable energy generation accounted for about 0.1% of total energy production.[89] However, in 2013 the amount of electricity generated by renewable sources has been slightly increased to 0.17%. By 2014, 100 units associated with the RES power generation was recorded.[90] As of 2015, Serbia has a total of 58.5 MW of energy production from the RES, which is 0.82% of total production capacity of the country's power system.

Currently (2015), Serbia's installed capacity of PPPs is mainly dominated by small hydro power plants with a total installed capacity of 34.862 MW which is 60% from the complete renewable energy mix.[91] The second most dominant PPP is co-gen, with 10.331 MW of installed capacity. The next is biogas with 4,862 MW of installed capacity, solar PV on buildings 1,557 MW, solar on ground 5.34MW and wind with 0.5 MW of installed capacity.[92] There are currently (2016) no biomass projects under operation.

4.4.1 Prospects of Costs and Benefits of Renewable Energy in Serbia

In the Serbia's coal energy production there are a number of extra costs which contribute to energy production. The extra costs is the costs derived from burring, transporting, displacement, as well as water and air pollution costs. Moreover, according to a study done by Health and Environment Alliance (HEAL), there have been losses of 2,000 human lives and somewhere from €1.8 – €4.9 billion in health costs attributed in some ways to the use of coal in The Republic of Serbia.[93]

Furthermore, the environmental damages are quite apparent in terms of land acidification, as well as in terms of damage done to agricultural land. These types of

[89] Center for International Relations and Sustainable Development (CISRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective, pp. 28
[90] Ministry of Mining and Energy of the Government of Serbia, www.mre.gov.rs
[91] Ministry of Mining and Energy of the Republic of Serbia, Registry of Privileged Producers of Electrical Energy, Ministry of Mining and Energy as of 17th June 2015
[92] Ministry of Mining and Energy of the Republic of Serbia, Registry of Privileged Producers of Electrical Energy, Ministry of Mining and Energy as of 17th June 2015

costs are understood as external costs of energy.[94] Including these external costs into the cost of electricity increases the cost to consumers. For instance, Serbia's cost of electricity from the coal lignite, is approximately 13 euro cents per kWh, however with the estimated external costs derived from loss of agricultural land as well as health costs, the cost then increases to 18.5 euro cents per kWh. Additionally, the external costs also are varied depending on the efficiency as well as the age of the power plants and can be driving the external costs even higher. [95] Due to the old age of Serbia's coal lignite plants, there have been also necessities to revitalize the plants, which in turn is a very highly priced investment. These forms of revitalizations include the installation of filters for the reduction of dust, as well as reduction of nitrogen oxide.[96] In Serbia, there has been a loan agreement between EPS and the Japan international cooperation Agency (JICA), in the value of € 250 million for the coal lignite plant.[97] Moreover, EPS is further estimating that another € 1.2 million will be needed for various filters, as well as purification of water for instance.[98] All these aspects in turn, could result in an increased cost of electricity as well as add a constraint on the budget of the country.

The impact of renewable energy producers on the economic development of the country is also a factor which needs to be taken into account. For instance, there could be financial benefits with the construction of the plants employing local construction firms as well as other sectors related to the construction of the plants, such as transportation, electrical work, logistics and maintenance. Moreover, in the case of Serbia, EU integration would be also a benefit to further improve political stability in the region. Normally, there are also environmental cost benefits as renewable energy sources are cleaner and not damaging to the health or general environment of the region.[99] In overall terms, it can be assumed that renewable energy investments swap long term fuel costs, for upfront investments.

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[94] EU ExternE study, European Commission, "Externalities of Energy", DG12, L-2920 Luxembourg, 2001; Gipe, P. (1995); Ferguson, R. (1990) Newcastle University UK
[95] EU ExternE study, European Commission, "Externalities of Energy", DG12, L-2920 Luxembourg, 2001; Gipe, P. (1995); Ferguson, R. (1990) Newcastle University UK
[96] Energy community
[97] Center for International Relations and Sustainable Development (CISRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective pp.40
[98] EPS, http://www.eps.rs/eng/article.aspx?lista=Sitemap&id=37, date accessed: May 2016
[99] European Movement in Serbia, "Serbian EU accession- Importance of Material Conditions in the Energy Sector", Belgrade, September 2013

4.4.2 Regulations

The Government of Serbia has since 2004[100] been active in enacting legislations in the energy sector. The first Energy Law was enacted in 2004 that issued the basis for renewable energy and energy efficiency development in the country. However, the more significant laws in respect to the RES, were enacted in 2009[101], particularly the law on defining the privileged power producer, in which renewable energy producers could receive the statues of "privileged producers." The same year included numerous other environmental, and energy amendments towards the renewable energy promotion, including the Law on ratification of the Kyoto Protocol.[102] Likewise, in the same year, the law was established for the ratification of the Energy Agency of The Republic of Serbia (AERS)[103], and the decree on feed in tariffs, which are all crucial factors on the overall promotion of renewables, regulation and formation of policies, as well as the active promotion of investors in the field. [104] As of 2006, Serbia is a member of the Energy Community in which it is obligated to enforce EU directives in relation to RES. The establishment of the AERS and the membership in the Energy Community is expected to aid the country in monitoring and transparency of the energy sector, as well as act on lowering corruption in the field. As of 2012, Serbia has established a new and revised Directive on the promotion of RES, and has established its NREAP (2013).[105] The new (2014) Energy Law further acts in the favor of the RES producers as it increases the bankability of the RES projects because all the RES producers can obtain status of temporary or "preliminary" privileged power producers (P-PPP). [106]

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[100] *"Official Gazette of the RS" No.84/2004 of July 24, 2004*

[101] Ministry of Mining and Energy of Republic of Serbia, "National Renewable Energy Action Plan", (2013) https://www.energy-community.org/pls/portal/docs/2144185.PDF, date accessed: April 2016

[102] Klimatske Promene, "Kyoto Protocol", (2010), http://www.klimatskepromene.rs/english/kyoto-protocol, date accessed: April 2016

[103] Ministry of Mining and Energy of Republic of Serbia, "National Renewable Energy Action Plan", (2013) https://www.energy-community.org/pls/portal/docs/2144185.PDF, date accessed: April 2016

[104] AERS "Energy Law", (2012), http://www.aers.rs/FILES/Zakoni/Eng/Zakon%20o%20energetici_57-11.pdf, date accessed: April 2016

[105] Republic of Serbia Ministry of Mining and Energy, "Progress Report on the Implementation of the National Renewable Energy Action Plan of the Republic of Serbia", (2014) https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3552161/0C749E6421E5236AE053C92FA8C02B67.PDF

[106] The new Energy Law enables temporary or preliminary privileged power producers to conclude a PPA without the PPP status as long as the P-PPP obtains the PPP status within the advised deadline. "Serbia-Energy", New Energy Law introduces wholesale supply of Electricity" (April 2015), http://serbia-energy.eu/serbia-new-energy-law-improves-ppa-and-status-of-privileged-power-producer/

Furthermore, as of 2013, further administrative and procedural barriers were weakened, as the PPP were defined, and high levels of guarantees for RES producers was granted, therefore further minimizing risk in the regulative bodies. [107]

4.4.3 National Renewable Energy Action Plan for Republic of Serbia

Serbia has in accordance to the EU Directive 2008/29/EC-Decision 2009/548 EC[108], developed its own renewable energy action plan. The plan was created with the assistance of a so-called "government to government" program, with the Kingdom of Netherlands[109]. In the action plan, targets (for 2020) are set in respect to country specific renewable energy perspective, as well as the measures to be utilized to achieve the set targets. The NREAP was assembled on the basis of energy generation from the RES which is dependent on various variables, such as factors including: economic development of the nation, the development of the energy market, the reliance of GDP and energy intensity, amongst others. Moreover, throughout the action plan it is stressed the need as well as the measures which have been/are to be put in place with the aim of attracting investments in the respective field. In that, as a commitment to the Energy Community Treaty, The Republic of Serbia has also pledged to apply EU directives on renewable energy.[110]

In The Republic of Serbia, the RES target was set to 27% of energy to be contributed from renewable energy sources by 2020. Moreover, besides the target share, Serbia is also obliged to implement all the necessary laws, administration and policies which are defined in the EU directive.[111] Additionally, the plan defines the necessary points which are also addressed in the requirements by the EU Directive, including the creation of reliable conditions for the development of the RES, competition in the energy market, establishing economic, commercial and financial

[107] Article22(1) e) of Directive 2009/28/EC
[108] Energy Community, Ministry of Energy, Development and Environmental Protection of Republic of Serbia, "National Renewable Energy Action Plan of Republic of Serbia "in accordance to Directive 2008/29/EC-Decision 2009/548/EC (Belgrade, 2013) https://www.energy-community.org/pls/portal/docs/2144185.PDF date accessed: February 2016
[109] Ministry of Mining and Energy of Republic of Serbia, "National Renewable Energy Action Plan", (2013) https://www.energy-community.org/pls/portal/docs/2144185.PDF, date accessed: April 2016
[110] Energy Community, "Treaty Establishing the Energy Community", (2003) https://www.energy-community.org/portal/page/portal/ENC_HOME/ENERGY_COMMUNITY/Legal/Treaty, date accessed: April 2016
[111] European Commission: Renewable Energy Directive, 2009, https://ec.europa.eu/energy/en/topics/renewable-energy/renewable-energy-directive, date accessed: February 2016

requisites in which production from renewable energy sources can be achieved, as well as the establishments of suitable conditions for investors in the RES field as well as connection to the power systems including connection to Non-EU and EU member states.[112]

Secondary regulations such as: licensing requirements, permit procedures, privileged producer status, supplier and grid requirements have as of late been adopted. Finally, in June 2016, the law amending the PPA package has been introduced although at a half a year delay.[113]

4.4.4 Main Stakeholders

Stakeholders of the energy sector are a crucial backbone of the RES market development. Since the emergence of the new market directly affects the relevant players, it is crucial to address them and to initiate their position in the RES field. The general factors, which influence the market, have been identified and discussed in more details below.

The highly relevant ministry for the implementation of RES policies and market establishments is the Ministry of Mining and Energy. The main role of this institution is to supervise the energy sector including policy regulation.[114] Furthermore, the Energy Agency of Serbia, (AERS), is the key player in legislation formation as well as in issuing of licenses, determining prices, issuing energy generation permits as well as international agreement implementation.[115] In terms of renewables, the agency is somewhat limited in its obligations, as the Energy Law[116] appoints the relevant ministry (Ministry of Energy) to oversee any actions in the relevant sector. However, it is nonetheless responsible for a number of aspects particularly in the regulatory and the

[112] "Official Gazette of the RS", No. 145/2014
[113] Balkan Energy News, "Long Awaited PPA Package Finally Adopted in Serbia", (June 2016), http://balkangreenenergynews.com/long-awaited-ppa-package-finally-adopted-in-serbia/, date accessed: June 2016
[114] Republika Srbija: Ministarstvo Energetike, Ministarstvo, 2016, http://www.mre.gov.rs/, date accessed April 2016
[115] AERS: Agencija za Energetiku Republike Srbije, O nama, 2016, http://www.aers.rs/Index.asp?l=1&a=1, date accessed April 2016
[116] AERS: "Energy Law", (2012), http://www.aers.rs/FILES/Zakoni/Eng/Zakon%20o%20energetici_57-11.pdf, date accessed: April 2016

legislative framework of the renewable energy sector. Moreover, the agency is involved in the ratification of legal documents prescribed by the transmission system operators as well as in the monitoring of transmission system operators. The rest of the operations in the field are as mentioned prescribed to the relevant ministry.[117]

Furthermore, the Energy Community is a crucial component. Serbia has been a member of the Energy community since 2006, through the adoption of the law ratifying the establishment of the Energy Community to non-EU member states. With the ratification of Energy Community membership, Serbia is obliged to adapt EU directives on energy.[118]

The other influential policy factor is naturally the current governing party, the Serbian Progressive Party (SNS), which is the basis for dictation of national priorities and goals including the EU membership and FDI attraction.

The significant utility stakeholder is the Public Enterprise "Elektro Privreda Srbije" or the" Electric Power Industry of Serbia" also known as EPS. The main activities of the institution is meeting all the electric power requirement, research and design, construction and maintenance for energy and mining plants. It is crucial to mention that EPS is the country's biggest producer of coal lignite, which is, as previously mentioned the main source of electric energy in the country. [119] The RES sector development is extremely important to EPS since EPS is also the owner of almost all of the generating capacities in the country, and the RES market development could contribute to a loss of share of the market. The level of impact will depend on EPS's ability to engage in the new market development. Thus far, EPS has initiated some RES projects (successfully in SHPP and Hydro), but has not made any significant progress, particularly when observing solar and wind. [120] The main reasons for this is the lack of

[117] Ministry of Mining and Energy of Republic of Serbia, "National Renewable Energy Action Plan", (2013) https://www.energy-community.org/pls/portal/docs/2144185.PDF, date accessed: April 2016

[118] Republic of Serbia Ministry of Mining and Energy, "Progress Report on the Implementation of the National Renewable Energy Action Plan of the Republic of Serbia", (2014) https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3552161/0C749E6421E5236AE053C92FA8C02B67.PDF

[119] EMS, "o nama" (2016), http://www.ems.rs/?lang=en, date accessed: April 2016

[120] EPS, "Renewable Energy Sources", (2016), http://www.eps.rs/Eng/Article.aspx?lista=Sitemap&id=106, date accessed: July 2016

financing as well as lack of technical regulative. [121] The future of EPS's market stake will also depend on the company's' management, technical expertise and further government orientation, in terms of investment in EPS or attracting outside independent power producers.[122] Other issues which may result in tougher economic conditions for the company are the rising coal prices due to EU and International Agreements, particular to environmental standards. [123] [124] Moreover, the EPS is the main purchaser of kWh produced, and therefore through PPA the EPS is obliged to purchase certain amounts of power produced from RES facilities.[125] This aspect, directly appoints EPS as a crucial factor in the diversification of energy and the policy developments as a whole.[126] Although it is still a public company, a planned reconstruction of the electric company has been put in place, more specifically it is a project to reform the company into a joint stock company.[127] The reconstruction of the company would result in a more liberalized market with split between the power generators, transmission entity and EMS (Transmission system market operator)[128], the country's power trading company. [129]

As an example of positive developments, since 2014, the Serbian government has established the country's power exchange company (SEEPEX), or the South East European Power Exchange.[130] Through SEEPEX a more liberalized market has been initiated, with the goals of integrating the SEE electricity market to that of the EU.

So far, the main investor in Serbia's energy market is still The Oil Industry of Serbia (NIS) in cooperation with Russia's Gazprom and is the largest contributor to the

[121] Institut za Zeleni Ekonomski Razvoj, inquires about EPS impact of RES market development, July 2016
[122] ibid.
[123] European Commission (EC), "Environmental Standards, Emission Ceilings" (2016), http://ec.europa.eu/environment/air/pollutants/ceilings.htm, date accessed: July 2016
[124] HEAL, "Press Release: Coal's unpaid health bill in Serbia estimated at €4 billion a year" (March 2016), http://www.env-health.org/IMG/pdf/18032016_-_serbian_pr_en_final.pdf, date accessed: July 2016
[125] ESIASEE, "Serbia: RES Market is yet to be developed with new electricity prices of state power utility, EPS", (July 2016), http://www.esiasee.eu/serbia-res-market-yet-developed-new-electricity-prices-state-power-utility-eps/, date accessed: July 2016
[126] Elektro privreda Srbije (EPS), "O nama", 2016, http://www.eps.rs/SitePages/index.aspx, date accessed March 2016
[127] EPS, "Support fromg the Ministry of energy and international institutions for EPS restructuring" (2015), http://www.eps.rs/Eng/Article.aspx?lista=novosti&id=38, date accessed: April 2016
[128] ibid.
[129] EMS, "o nama" (2016), http://www.ems.rs/?lang=en, date accessed: April 2016
[130] Serbia Energy, "Serbia Exclusive: Energy Exchange to Include Montenegro and Macedonia", December 2013, http://serbia-energy.eu/serbia-exclusive-energy-exchange-sepex-to-include-montenegro-and-macedonia/, date accessed: June 2016

country's budget (14%) and has renewable energy projects, more precisely ones in cogeneration facilities, with an overall output of 25MWt[131].

Naturally, as of 2011there has been a large interest by foreign players in Serbia's energy market, particularly the RES market. Therefore, there has been a growing diversification of players in the field. Such actors, include to a great extent EU, US , Canadian and Chinese foreign investors.[132]

The other stake holders which are particularly crucial for the financing aspect of the RES projects, are the major development banks and financial institutions such as: the World Bank (IFC), EBRD, EIB, EC, KfW to name the major few. But also increasingly, the local commercial banks have become stakeholders in financing aspect of RES projects.[133]

In terms of consumers, it is crucial to keep in mind the interests and perception of the local communities in which the construction of the RES plants may be seen, but also to consider the general population opinion as electricity prices are a highly sensitive topic amongst civil society.

As a positive effect, there is a great benefit to promote potential for the local employment for feasibility RES studies, for contracts with local engineering firms, and or local construction and service companies of relevance.[134]

4.5 Typical Risks in RES Investments in Serbia

Investors need to assess the country's risk when evaluating overall feasibility of projects. In fact, since renewable energy is still a developing market in the country,

[131] NIS, "Cogeneration Projects" http://www.nis.eu/en/about-us/our-business/energy, date accessed: July 2016
[132] Balkan Energy, Sept. 2015, Country Report on Energy Business in Serbia
[133]Deutsche Zusammen Arbeit, "KfW development bank in Serbia" 2016, http://www.15godinasaradnje.com/organizations/kfw.php, date accessed: July 2016
[134] UNDP, "Guides for Investors in Renewable Energy Sector in Serbia" , 2013, http://www.rs.undp.org/content/serbia/en/home/presscenter/articles/2013/02/27/guides-for-investors-in-renewable-energy-in-serbia.html, date accessed: April 2016

there is normally far more risk than in developed renewable markets such as in Germany for instance[135]. Some risks which are particularly sector specific include:

- Sudden policy change risk and administrative risk [136]- although the government's policy is directed towards EU membership[137] there are constantly new policies developing in terms of the RES and therefore, the risk of policy change is quite present. Lack of stability and predictability in the country's legislation is quite apparent such as key legislations pertaining to construction permits,[138] for example. The law on planning and construction has for instance been amended three times since 2011. According to the "National alliance for local economic development (NALED), 2/3 of Serbia's laws is enacted without the consent of business and or civil society sectors.[139] Moreover, the adoption of certain legislations comes at a delay[140] and therefore causes lack of confidence for investors. This sudden policy change is of special concern to the RES sector, because it is as mentioned a trending and actual sector, one that has not existed previously, and therefore legislations are being amended continuously. An example of such a change in law is the recent (June 2016) adaptation to the Energy Law. [141]

- Social acceptance risk: Public awareness and acceptance e of renewable energy is still not viable in the country, and therefore there exist risks associated with the adaptation of renewable energy policies, and development of projects. As an example of low social awareness, a study (2012) by Ninamedia[142] revealed that, 83% of citizens of Belgrade did not see any correlation between pollution and electricity

[135]Center for International Relations and Sustainable Development (CIRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective, pp. 28
[136] Ibid.
[137] GEF Trust Fund, Project Identification Form; "Removing Barriers to Promote and Support Energy Management Systems in Municipalities in Serbia", (2013) Table 3; Risks and Mitigation Measures, www.gef.com
[138] Center for International Relations and Sustainable Development (CISRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective pp.52
[139] II Regulatory Index of Serbia produced by NALED in June 2014; http://www.naled-serbia.org/en/news/817/II-Regualtory-Index-of-Serbia-presented
[140] I Quarterly Report on the Status of Reforms in 2014, http://www.naled-serbia.org/upload/Document/File/2014_08/Report_for_I_quarter_2014_Status_of_regulatory_reform.pdf
[141] Lexology, "New Renewables Incentive Scheme", June 2016, http://www.lexology.com/library/detail.aspx?g=d1768d2a-73a0-4bb9-b703-4ac75b1ad093, date accessed: June 2016
[142] Ninamedia is "an agency specialized in media content in Serbia and the region", http://www.ninamedia.rs/rs/home/,

generation. Of course this is not the only indicator that RES awareness is low. Moreover, many citizens of the country feel that renewable energy or environmentally friendly endeavors represent a luxury which Serbia is not able to provide, as there are far greater challenges in the country. The general idea is that thermal power plants (TPPs) provide cheap electricity, and therefore other types of power generation should not be acknowledged.[143]

- Financing risk: Currently (2016) the renewable energy market in Serbia is in the stage of development and therefore,[144] it is rather expensive to finance. As mentioned earlier, renewable energy investments are perceived to be riskier as they require capital upfront before the realization of the project or rather before the project's profitability and or operation.[145] This aspect from the start increases the risk rate and it requires a greater return on investment. Furthermore, institutions for financing are not always readily available through commercial banks for instance. Also, projects take more time to complete as regulatory bodies still aren't fully developed or are not stable and therefore the cost of project is higher.[146]

Instabilities which exist in legislation particularly when it comes to PPAs [147] are another aspect of risk which is greatly associated to financing. Lenders are very highly exposed to financing for the RES projects. For instance, a medium sized wind farm may cost 300 million euro, out of which 30% is derived from equity funds, and the rest from lenders. The lenders therefore require a substantial guarantee in order to make certain the PPAs are enforced, as the PPAs are considered a contract which is the foundation for lending schemes.[148]

- Technical and management risk: The most apparent technical risk associated with investments in the RES in Serbia is the integration of renewable

[143] Center for International Relations and Sustainable Development (CISRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective pp.56
[144] Ibid.
[145] Diacore, Frauenhofer ISI, Feburary 2016, The Impact of Risks in Renewable Energy Investments and the role of Smart Policies, Final Report; ECOFYS
[146] Center for International Relations and Sustainable Development (CIRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective pp.56
[147] Serbia energy, "Serbia, Wind developers claim new electricity purchase model not appropriate for banks, MinENergy confirms quality of solutions" Sept. 2013, http://serbia-energy.eu/serbiawind-developers-claim-new-electricity-purchase-model-not-appropriate-for-banks-minenergy-confirms-quality-of-solutions/, accessed on May 2016
[148] Center for International Relations and Sustainable Development (CIRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective,

generators to the local power grid. There is not always adequate interconnection point to the National grid due to either the remote location or outdated transmission systems. Moreover, professional assessment is often lacking and therefore causing unnecessary delays, issues, and obstacles in the process.[149]

[149] ibid.

5 Republic of Serbia – External Factors Influencing RES Sector Development

Serbia remains a country with as mentioned a transitional, challenging business environment and economic position. Nonetheless the invitation by the political dominant party instigates the development of the said market, and allows room for investment and cooperation with interest groups including investors towards the development of the market. The traditional power production and policies are not up to par with the necessary aspects which need to be sought after for plausible projects to be completed. Therefore, external factors such as international financial institutions (IFIs) and national development agencies, have created a presence in the country's market development and promotion of the RES. Such external factors are currently present in the country and without their influence the RES market development would be far more challenging if not impossible.

5.1 IFIs in Serbia

The presence of foreign banks and foreign investors has existed in the country since 1990s, and early 2000s. The governments in power have been since then very active in attempting to attract foreign investments as capital was greatly needed as a result of a complete crash in the GDP and hyperinflation.[150&151] This has also been done largely through the "aid" of foreign banks particularly the IMF, World Bank and EBRD. These three major institutions played a massive role in the restructuring of the country's economy, developing its new markets including its financial market. The role of these banks and institutions is also very much present today particularly in the energy and finance sectors.

IFIs are also extremely significant in the promotion or the implementation of international policies, in the context of the projects they chose to finance and support.

[150] 2001, the GDP of the country decreased by 40% (of 1989 level), inflation was 112% at annual level, exports were less than 15% of the GDP. [150]

[151] ECONOMIC ANNALS, Volume LVI, No. 191 / October – December 2011, Privatization in Serbia, Results and Institutional Failures p. 97

International financial institutions which are to a great extent owned by governments have been throughout history (case of East and Central Europe transformation) influencing governments as well as the social and economic evolution of a nation.[152] The position of the institutions is no different today in The Republic Serbia and the Western Balkans as a whole. The main financial institutions that are very much present in the area are the European Bank for Reconstruction and Development, The European Investment Bank, the World Bank amongst others. [153] These banks particularly the EBRD and the EIB are by majority EU banks, which are expected to follow EU policy. This aspect is not meant to change when observing the energy sector.

International financial institutions as well as development agencies provide a support in a way to address the obstacles which may exist in the country in order to develop the certain markets and mitigate risk. There are a number of ways in which these organizations are acting.

- Firstly, the IFIs and national development agencies are greatly involved with projects involving policy dialogue. Through *policy dialogue*, the risks involved with administrative as well as regulative (i.e. sudden policy change risk) uncertainties can be or is minimized.
- The second way that IFIs acts in developing countries is through projects addressing *technological and management risks* such as feasibility studies or contracting projects for the testing of transmission lines for instance.
- Furthermore, IFIs are greatly involved in addressing *financing risks*. As mentioned previously renewables are an example of capital intensive investments, even more so in underdeveloped markets. Therefore the role of IFIs is crucial in offering financing to developers for projects, and or working with local banks to offer loans through the major IFIs credit lines for RES projects. This aspect is probably one of the most crucial ones for investments, as financing is the key to developing a project. As the state owned EPS, is for the most part unable to fund RES projects due to the high public debts, high cost of capital as well as the unattractive position for private

[152] STANDING, G. (2002): 'The babble of euphemisms: re-embed- ding social protection in "transformed" labor markets', in RAINNIE, A., SMITH, A. and SWAIN, A. (eds): Work, Employment and Transition: Restructuring Livelihoods in Post- Communism. Routledge, London, pp. 35-54.
[153] Gallop Pippa, CEE Bankwatch Network, South East Europe Sustainable Energy Policy (2013) Invest in Haste Repent in Leisure, Are IFIs Behaving as if EU accession criteria and extreme energy losses do not exist in South Eastern Europe, SEES (2013)

investors, other players, in most cases foreign investors, are mainly the ones investing in such projects. The special role of the IFIs are that they are to invest in projects where funding is not normally available at lower rates. This is specifically the case of renewables in the region; as such investments are not ones where smaller local banks are accustomed to and where the market has been developed to that extent. These investors rely greatly on development banks and funds for their access to capital. IFIs are the ones taking on the risk however, they are also the ones who are implementing risk mitigation measurements which are extremely relevant for project completion.

- Moreover, IFIs and national development agencies are in the case of Serbia greatly involved in *liberalizing the electricity market.* Through the EU directive, organizations are involved in supporting Serbia in market openness when it comes to electricity through various other platforms as well as the restructuring and transformation of the state owned electric company. This aspect is crucial as open markets would allow independent power producers to sell to consumers in the country.

The main entities in the respective field are: EBRD (regional energy efficiency program), the European investment bank (EIB), The Western Balkans Investment Fund, the European Commission, the KfW, the European Commission, USAID and IFC (World Bank).

5.1.1 The European Bank for Reconstruction and Development (EBRD)

The EBRD [154][155] has been active with Serbia since 2001. In fact, Serbia is the biggest recipient of EBRD funding in the region.[156] According to the EBRD website, the bank focuses on: financing of SMEs projects (small medium enterprises), financial intermediation including the improvement of credit growth, and the decline of non-performing loans, but also improving cross border financial (banking) cooperation. Its current (2015) financing portfolio accumulates to Euro 2,445 million. Out of this the main sectors in which the EBRD is active in are projects in; Energy (16%), Financial

[154] "The EBRD was established in 1991 to promote liberalization in formally planned economies. Focus on transitional economies and support in countries where "multi party democracy" is present from central Europe to central Asia (as of late Mediterranean i.e. due to "Arab Spring"

[155] EBRD, 2016, Who we are, http://www.ebrd.com/who-we-are.html, date accessed March 2016

[156] Gallop Pippa, CEE Bankwatch Network, South East Europe Sustainable Energy Policy (2013) Invest in Haste Repent in Leisure, Are IFIs Behaving as if EU accession criteria and extreme energy losses do not exist in South Eastern Europe, SEES (2013)

institutions (30%), Industry, Commerce and Agro Business (17%), and Infrastructure (37%). From 2001 to 2015, the EBRD has financed 201 projects.[157]

The scope of activities of the EBRD in Serbia's RES sector include: techno-economic challenges in power system operation, eliminating financing barriers, performing policy dialogue, raising Awareness, feasibility studies and Liberalization of power markets.

5.1.1.1 Restructuring and liberalization of state owned company

The EBRD together with the World Bank is involved in a project related to the restructuring of Serbia's state owned electric company Elektro Privreda Srbije (EPS). The restructuring of the state owned institution is expected to further liberalize the energy market in the country, and in turn, be far more viable for investments in the renewable energy sector to be realized. A part of the € 200 million loan guaranteed to the institution is expected to refinance debt from the EPS which the EPS was indebted as a result of 2014 floods [158] in the country but also the loan will be used for the financing of technical and consultation support, in terms of restructuring the institution in to a corporatized joint stock company. The bank is also expected to support its policy dialogue and to reform the sector, including the reform of EPS's tariff policy, adjustments to EU's regulations, and in support of further liberalizing and developing markets. [159]

5.1.1.2 Financing for RES

As mentioned, the bank is to follow EU directives on sustainable energy. Therefore, the scope of its projects should be focused on improving and or creating the so called "Green Economy Transition." However, there have been (especially in past years) financing projects which were not in accordance to the banks mission. Such a project includes the financing (for the expansion) of country's biggest coal ignite plant, under the name "environment improvement project." However due to massive protest

[157] European Bank for Reconstruction and Development, 2016, History, EBRD http://www.ebrd.com/who-we-are. Html, date accessed: February 2016
[158] EBRD, "EBRD delivers financial support for Serbia after floods" (May 2014), http://www.ebrd.com/news/2014/ebrd-delivers-financial-support-for-serbia-after-floods.html, date accessed: May 2016
[159] Serbia SEE Energy and Mining News, "Serbia Exclusive: Power Utility Company EPS Preparation for market liberalization restructuring supporters and opposition, Report" (2013), http://serbia-energy.eu/serbia-exclusive-power-utility-company-eps-preparation-for-market-liberalization-restructuring-supporters-and-opposition-the-report/, date accessed: May 2016

by the local population, including the civil society, the project has been put to a halt. Another project, which the EBRD has financed despite that it not being in par was an existing power plant (ownership of EPS) used for district heating. The financing of this specific plant, was controversial as it is not in line with the EU's legislation, more specifically with the EU's large Combustion Plant Directive. The plant was actually supposed to be closed down, but with the help of EBRDs financing, the plant will be in service for another 20 years. [160]

However, as of more recently, the EBRD has been increasingly involved with financing for RES projects. The EBRD has approved financing for the reconstruction of 15 small HPPS, which are in the ownership of EPS. The EBRD is to provide € 45 million out of the € 50 million needed for complete reconstruction project.[161] The other major RES project in which the bank is involved with is the financing for one of Serbia's biggest (158 MW) wind farm projects. The target completion date for this project is November 2016.[162] Furthermore, the bank has attempted to deploy financing through the Western Balkans Sustainable Energy Direct Financing Facility (WeBSEDFF), however before the adoption of secondary legislations under which is understood feed in tariffs, and purchasing power agreements (PPAs), there has been not much progress thus far.[163] When the secondary legislation is implemented (it has as of June 2016 been however adapted), financing of the RES projects should be more readily available, and the cost of financing should be decreased, as in the risk of investment should be lowered.[164]

5.1.1.3 Technical and Management Risk

The EBRD also provided financing in order to reduce risks associated with technical and management obstacles existing in the sector. Initially with the start of the

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[160] Sikorova, Gallop for CEE Bankwatch Network, "Financing for Hydropower in Protected areas of Southeast Europe", December 2015

[161] EBRD, April 2013, Transport and Energy in Serbia, http://sedi2.esteri.it/sitiweb/sistemapaese/serbia/ebrd.pdf, date accessed: April 2016

[162] EBRD, "Dolovo Cibuk I Wind Farm" (Feb.2015), http://www.ebrd.com/work-with-us/projects/psd/dolovo-cibuk-i-wind-farm.html, date accessed March 2016

[163] Energy Savings Group, 2012, project, http://www.esg.rs/files/project/pe27.pdf, ESG, date accessed March 2016

[164] IRENA, Renewable Energy in South Eastern Europe, Background Paper; Practical Policies for Financing Renewable Energy Action Plan Investments, 2013

RES market development, the EBRD was involved in feasibility studies such as the "Power Network Analysis for Wind Power integration"(2011). Through this analysis an assessment of the prevailing power network was presented, as well as the potential or feasibility for wind power projects.[165] This aspect was key for initiating the market, and presenting the potential and possibility for market development. In terms of solar energy feasibility, the bank has also been active in the "Solar Energy Development", the analysis of the countries solar power technologies as well as associated training in the sector.[166]

In order to provide further initiation of wind market potential, the EBRD has been involved in financing of further studies such as the sustainment of the grid. The cap for wind producers has been put on 450 MW as it was assessed that the grid can sustain that much power, however after the study, it has been revealed that in actuality 1000 MW can be sustained. [167]This in turn can play a role in amending the legislation, based on this reassessment of technical capacity of the grid, and therefore further support (in this case) wind power producers in establishing themselves in the country. In fact, as of December 2015, the cap on wind power producers has been raised to 500 MW.[168]

5.1.1.4 Policy Dialogue

The EBRD is together with other financial institutions actively involved in the policy dialogue. The bank was involved in the policy dialogue with the Ministry of Energy, government in power, as well as other stake holders in the development of the Energy law (2011) which has officially opened up the power market for suppliers, to

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[165] Ministry of Mining and Energy of Republic of Serbia, " Progress Report on the Implementation of the National Renewable Energy Action Plan of the Republic of Serbia", (Dec. 2014), https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3552161/0C749E6421E5236AE053C92FA8C02B67.PDF, date accessed: May 2016

[166] ibid.

[167] Vatenfall Europe, GmbH, "Grid Study Calculations", http://www.vpc-group.biz/index.php?id=102&L=1, date accessed: May 2016

[168] wind power monthly, "Analysis: Investors note Serbia's 500 MW Ambition", Dec. 2015, http://www.windpowermonthly.com/article/1377323/analysis-investors-note-serbias-500mw-ambition, date accessed: May 2016

industrial, and for household consumers as of 2015. [169] Moreover, the bank is involved in projects which as mentioned are oriented around policy dialogue, such as the 2012 initiative supporting the Serbian Ministry of Energy in creating the legal framework for the use of renewable energy sources.[170]

Furthermore, in initial "market initiation phase" the EBRD has been involved in calculating "Capacity Building for Renewable Energy". The bank has in this particular project been involved in the assessment of the impact of affordability of RES based on the national targets. Basically, the bank aided in assessment of the NREAP in the Serbia specific case.[171]

Also, the bank is, together with the European Western Balkans Joint Fund, currently involved in a project involving policy dialogue including "regional prioritization" of country assignments as well as the development of the country's energy efficiency policy and dialogue. [172] The bank is also involved in dialogue with various chambers of commerce, embassies, as well as appropriate government agencies, for the promotion of foreign investments in the country.[173]

5.1.2 The Green Growth Fund

The Green Growth Fund (GGF), a fund with a shareholder combination of IFC, KfW, EIB, EBRD, EC to name a few, has been active in Serbia since 2009. The Funds' aim is to enable financing of sustainable energy projects in the country and the region. [174]

The fund acts as a financial risk mitigation tool for RES projects by directly or indirectly (through local banks) financing projects. So far, (2009 to 2016) there have

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[169] EBRD, Pioneering Renewable energy , projects: Serbia, 2016, http://www.ebrd.com/news/2016/pioneering-renewable-energy.html, date accessed April 2016

[170] Energy Savings Group, 2012, Western Balkans Sustainable Energy Direct Financing Facility: Institutional Capacity Building, Sub-assignment 2: Support the Ministry of Energy and Mining of Serbia in creating of the legal framework for the use of renewable energy sources , ESG, http://www.esg.rs/files/project/pe27.pdf

[171] Energy Community, "Serbia Renewable Energy Progress Report" (2010)

[172] Energy Savings Group, 2015, project: European Western Balkans Joint Fund, Energy Efficiency Framework, http://www.esg.rs/files/project/pe38.pdf, ESG date accessed March 2016

[173] EBRD, Pioneering Renewable energy , projects: Serbia, 2016, http://www.ebrd.com/news/2016/pioneering-renewable-energy.html, date accessed April 2016

[174] Green Growth Fund, "Enabling Energy Finance: GGF for SEE", (2012), http://www.eclareon.com/sites/default/files/10_dominic_hereth_green_for_growth_fund_southeast_europe.pdf

been five loans, used for the promotion of energy efficient as well as renewable energy markets, loans, to banks, in the worth of € 58 million. [175]

5.1.3 USAID

5.1.3.1 Policy Dialogue

The USAID is indirectly involved in RES development market. For instance, the development agency is highly involved in policy dialogue in order to make investments in general more viable. This can be observed through USAID officials, close dialogue with the Ministry of Construction, Transportation and Infrastructure, in accordance to the development of a new Law on Construction and Planning. The new law, adopted in 2014, has improved the condition for investors to deal with only one public sector in acquiring permits, [176]as opposed to previous, where investors had to communicate to a number of institutions.[177]

The USAID has been involved in feasibility studies for biomass, more specifically for DHP (district heating plant) fuel conversion to biomass studies.[178]

5.1.4 UNDP

As a part of the "Policy advice on Renewable energy sources" project with the Ministry of Energy, Development and Environmental protection, the UNDP has been since 2012 involved in promoting investments in RES sector. As a part of the project, the UNDP has created updated guides, for investors and developers, based on all necessary procedures and aspects involved in constructing a plant in the country.[179]

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[175] Green Growth Fund, Investments: Serbia, http://www.ggf.lu/finance-energy-in-eastern-europe/investments/serbia/, GGF, date accessed: March 2016

[176] Ministry of construction, transport, and infrastructure of Republic of Serbia, 2014,"Draft Law on Amendments to the Law on Planning and Construction, http://www.mgsi.gov.rs, date accessed: June 2016

[177] USAID, "Government of Serbia passed new law on Planning and Construction with USAID support" 2014, https://www.usaid.gov/news-information/events/government-serbia-passed-new-law-planning-and-construction-developed-usaid-0 , date accessed: May 2016

[178] Ministry of Mining and Energy of Republic of Serbia, " Progress Report on the Implementation of the National Renewable Energy Action Plan of the Republic of Serbia", (Dec. 2014), https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3552161/0C749E6421E5236AE053C92FA8C02B67.PDF, date accessed: May 2016

[179] UNDP: "Guides for Investors in Renewable Energy in Serbia", 2013, http://www.rs.undp.org/content/serbia/en/home/presscenter/articles/2013/02/27/guides-for-investors-in-renewable-energy-in-serbia.html, date accessed May 2016

The UNDP is strongly involved in policy dialogue in various forms of the RES. One example is the project involved with biomass power producers, together with the GEF (global environment fund), in correlation with the Ministry, for adapting the preferential laws and decrees on biomass production.[180]

The UNDP has also been active (mainly since 2009 to 2016) in the promotion of Biomass as well as the promotion of RES in general, mainly through funding of feasibility projects and dialog with local municipalities.[181]

5.1.5 IMF

The IMF has been, and currently is monitoring the restructuring of the state owned company, EPS. The corporatization process of the electric company is said to take up to five years, but with the opening of the EMS transmission company to the stock market, more open and competitive trading is making a presence in Serbia.[182]

5.1.6 European Commission

The European Commission, through its "Instruments for Pre-accession assistance 2014 to 2020" is a key player in dictating the rule of law in the energy sector.[183] The Republic of Serbia is expected to implement all the EU Energy packages, particularly in correspondence to the RES directive. The monitoring and implementation is however a more challenging aspect. Nonetheless, the EC is working directly with ministries in charge for the implementation of further energy packages which are in line with the EU acquis.

The other goal of the EC is to fully liberalize and to commercialize the energy market and to increase the use of the RES. In order to aid in the increased use of the RES, the EC has and is providing the appropriate ministry with technical expertise. The financing agreement to the energy sector from the EU is total cost of € 15 million

[180] Biomass Project: Reducing barriers to accelerate the development of Biomass market in Serbia, Nis, 2015, http://biomasa.undp.org.rs/wp-content/uploads/2015/10/ENGL-GEF-Projekat-Biomasa-Maja-Matejic.pdf, date accessed: May 2016

[181] Open Aid Data, "Energy Serbia, UNDP" 2013, http://www.openaiddata.org/purpose/63/230/959/, date accessed: July 2016

[182] Serbia Energy, "Serbia exclusive power utility EPS, restructuring under IMF monitoring, interview with EPS CEO Aleksandar Obradovic" January 2015, http://serbia-energy.eu/serbia-exclusive-power-utility-eps-restructuring-under-imf-monitoring-interview-with-eps-ceo-aleksandar-obradovic/, Date accessed: April 2016

[183] European Commission, "Instruments for Pre accession assistance IPA III", 2014-2020, "Serbia Support to the Energy Sector", http://ec.europa.eu/enlargement/pdf/serbia/ipa/2015/2014-032799.06-serbia-energy.pdf, date accessed June 2016

with a total EU contribution of about € 12 million. This amount is the budget for the six years between 2014 to 2020, until when all mentioned RES goals as well as energy market goals are to be achieved.[184]

5.1.7 European Investment Bank

The European Investment bank has provided a loan of € 2.5 million on Serbia's behalf to the green growth fund. The fund provides credit lines to the local banks in order to finance energy efficiency and or develop renewable energy projects. The Green Growth Fund covers non EU countries, including Balkans, Turkey and "eastern neighborhood" region.[185] The EIB itself has also been involved in nine different projects in Serbia. [186]

5.1.8 KfW

Credit lines are offered to Serbian banks, on behalf of the KfW development bank moreover, the bank is involved in promotion of the RES sources and energy efficiency and has until now loaned € 850 million to Serbia, in its RES.[187]

The KfW was also involved in pre-feasibility studies costing around € 110 million towards the development of the biomass sector. (2012)[188] Moreover, with cooperation with local authorities, self-implementation of the biomass projects was promoted for the local heat plants.

Feasibility studies were also financed and provided for the wind "quality" analysis (in terms of suitability for developing wind generation projects).

5.1.9 IFC

[184] European Commission, "Instruments for Pre accession assistance IPA III", 2014-2020, "Serbia Support to the Energy Sector", http://ec.europa.eu/enlargement/pdf/serbia/ipa/2015/2014-032799.06-serbia-energy.pdf, date accessed June 2016

[185] EIB," Environmental and Social Data Sheet" Luxembourg, 2013, http://www.eib.org/infocentre/register/all/48418853.pdf, date accessed: June 2016

[186] Ibid.

[187] KFW, "Serbia an important partner in South Eastern Europe", Energy for all, 2016, https://www.kfw-entwicklungsbank.de/International-financing/KfW-Development-Bank/Local-presence/Europe/Serbia/, date accessed: June 2016

[188] Ministry of Mining and Energy of Republic of Serbia, " Progress Report on the Implementation of the National Renewable Energy Action Plan of the Republic of Serbia", (Dec. 2014), https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3552161/0C749E6421E5236AE053C92FA8C02B67.PDF, date accessed: May 2016

Another institution providing financing for projects in Serbia is the IFC. The role of banks such as the IFC for this sort of financing becomes predominant.

The IFC has thus approved financing for a potential wind farm, in the amount of € 70 million[189] however, the particular wind farm project is still on hold.[190]

5.1.10 Norwegian Assistance to Serbia

The Norwegian Assistance to Serbia has as of 2013 been involved in a project which incorporates local activities in sustainable energy projects. In collaboration with the Ministry of Mining and Energy, the project is planned to aid and transfer knowledge to Serbian experts that have a goal of transferring energy policy on the local level. Although most of the aid has been directed at energy efficiency, there have also been mentionable projects in technology transfer for local communities as well as biomass related activity.[191]

5.2 Section Summary

It can be stated that through the analysis of the external and internal RES factors in the thesis, it could be observed the importance and the evolution of different phases and policy capacities which have taken place or are taking place in Serbia's RES development.

The initial phases of "market initiation" have been started with the aid of pre-feasibility tests, and monitoring and planning of energy capacities in the country. Furthermore, with the obligation to the Energy Community on adapting and implementing the EU Directives, there is an initiation from the government and the relevant ministry in accordance to establishing a market. Additionally, in order to provide for a more transparent and regulative bodies in the monitoring of the RES development, including the project aid in obtainment of permits, bodies including the Energy community, and the AERS have become active in the respective sector.

Naturally, since this is a new market there are numerous technical tests and procedures that need to be done in order to enable the RES potential utilization in the

[189] IFC, "Dolovo Wind,"Dec. 2014, Environmental and Social Review Summary, http://ifcextapps.ifc.org/ifcext/spiwebsite1.nsf/78e3b305216fcdba85257a8b0075079d/cfa7da1ff49b4f7185257db30062896e?opendocument, date accessed: April 2016

[190] Ibid.

[191] Open Aid Data, "Projects by Norway to Serbia" 2011-2013, http://www.openaiddata.org/purpose/63/230/8/, date accessed: July 2016

country. These pre-feasibility tests, have mostly taken place the early stages of RES development in the country. The next aspect was to address the appropriate legislations which are more in line with the preferential and attractive policies for the RES investors. Although, some are currently still not completely satisfactory for all investors, there have been significant improvements in the field. Mainly expertise and consultation to the appropriate legislative bodies was provided, including aid by national development agencies, in policy creation. With the creation of the new energy laws and amendments to the RES directives, we observe some advancements in the right direction of the implementation of the RES goals. Such developments are observed in the increase of investors in Serbia, as technical studies have proven that not only does RES potential exist, but it is a widely untapped market. This was facilitated by political orientation directed towards further implementation of EU energy packages in favor to the RES investments. Since 2011, there have been a number of PPP registered in the country, as well as some advancement towards the completion of the RES projects. The IFIs have acted as important, perhaps crucial forms of financing for the projects, due to the country's economic development stage and high risk factor for financing investments. The market has been thus far, established, however, risks are still apparent. The confrontation of these risks, has been mainly directed at further technological studies, policy dialogues and as of late, the creation of a set of laws with the help of interest groups, which should be removing most barriers for large scale RES projects, particularly in the wind sector. Further obstacles and constraints which are found in related legislative bodies, such as the relevant "construction law" has been through the aid of development funds, and financial institutions amended to the benefit of investors, particularly of importance to the RES construction bodies. Simplification in the permit issuing process and consolidation with relevant agencies as well as the further monitoring of activities, related to obtainment of permits, has been created. Furthermore, the liberalization of the country's power market has been even more improved, the EPS restructuring is initialized, so that all consumers should be able to purchase electricity on the diversified energy market, instead of the monopolized market.

The promotion of the RES market has been thus far a very active component in the Serbia's economic as well as the energy sector and the associated trends in addressing the RES obstacles are continually evolving.

6 Lesson Learned from Available RES Projects in Republic of Serbia

After close review of various projects in the RES of Republic of Serbia, there have been quite a few revelations of obstacles and dilemmas investors and developers are facing throughout their project completion. Some of these obstacles take form of the bureaucratic complications in obtaining permits and some, particularly in the case of Wind energy, take form of prolonged waiting for the agreeable PPAs to be drafted by the government. We also have observed that some sectors are far more developed and are developing quicker than others. This is the case of SHPP in particular. Hydro power has already existed in the country decades prior, [192] however the large plants are not particularly found to be sustainable energy sources.[193] Therefore, SHPP are much more sustainable in that sense, although they also often cross the line between sustainability and sources which can and do damage the environment. Interestingly, in the case of the SHPP, the specifications on their environmental impacts have not yet been fully defined. Furthermore, since the market is new, with the trial and error of project development we come to conclude that based on obstacles which have and are existing in project completion the government and other bodies involved are amending and facing the issues which exist. Through practical analysis of some projects we come to turns that there is particular interest in the sector, but the completion aspect still remains one which is challenging. The communication of different stakeholders such as utility companies and local municipalities has proven to be of extreme importance, particularly when observing large scale projects. Moreover, direct contact between relevant government bodies is observed in numerous project endeavors. The role of IFIs can also be observed, as they are in most cases the main sources of financing of the projects and therefore the importance of their presence is undeniable.

[192] Svetislav Marković, Tatjana Lazović Ljubica Milović, Bratislav Stojiljković "The First Hydroelectric Power Plant in the Balkans Built on the Basis of Tesla's Principles" Explorations in the History of Machines and Mechanisims, 2012, Vol. 15, pp. 395-406

[193] RenewMo, "Large Old Hydroelectric power: why it is NOT included in most Renewable Energy Standards", (Feb. 2013), http://www.renewmo.org/uploads/3/6/4/0/3640039/__13.2.25_february_final.pdf, date accessed: May 2016

6.1 Small Hydro Power Plants

Small Hydro Power plants (SHPP) project have been increasingly present in the country. SHPPs have achieved thus far the greatest development in the sector. The quota set by the NREAP requires 188 MW of SHPPs or 16% of the total 1092 MW by 2020. [194]

However, SHPP's are often found damaging sources of energy production, as they can and do in some cases endanger an environment especially in protected areas. Therefore, hydro power including small hydro power plants is often seen as a gray line between environmentally sustainable and harming form of power production. At the same time, it is not clear in Serbia's legislation whether or not SHPPs are damaging and in what case and to what extent.[195]

It was also noticed a questionable role of International Financial Institutions, particularly the role of EBRD and EIB, in financing many of these project, either directly or through commercial banks along their credit lines, without compliance with the legislation under the EU, such as the "Birds and Habitats Directives and Water Frame work Directive."[196] Due to the fact that Serbia's legislation is not yet developed to define and specify the validity and environmental sustainability of the small hydro power plants, it is left extremely vulnerable to exploitation of environment. Unfortunately, the country has not yet proceeded in adapting the framework for Birds and Habitats and water.[197] According to a study done by Serbia's bank watch[198], where 88 planned projects were taken into consideration, 57 were greenfield investments and 34 were SHPP taking place in protected areas.[199] CEE Bank watch has distinguished financing for 14 green field projects out of which 5 are being financed by the EBRD, and it is worth mentioning that none of them are in protected areas.[200] Three of those projects are being financed by commercial banks, (Erste and Unicredit), through the

[194] Ministry of Energy and Mining of The Republic of Serbia, "National Renewable Energy Action Plan" (2013), https://www.energy-community.org/pls/portal/docs/2144185.PDF, date accessed: February 2016
[195] Sikorova, Gallop for CEE Bankwatch Network, "Financing for Hydropower in Protected areas of Southeast Europe", December 2015
[196] CEE Web, "Natura 2000 Implementation Factsheet" 2010, http://www.ceeweb.org/wp-content/uploads/2012/01/Fact-sheets_Serbia_updated.pdf, date accessed June 2016
[197] Sikorova, Gallop for CEE Bankwatch Network, "Financing for Hydropower in Protected areas of Southeast Europe", December 2015
[198] Sikorova, Gallop for CEE Bankwatch Network, "Financing for Hydropower in Protected areas of Southeast Europe", December 2015
[199] Ibid.
[200] Sikorova, Gallop for CEE Bankwatch Network, "Financing for Hydropower in Protected areas of Southeast Europe", December 2015

EBRD credit lines. [201] Therefore, we come to observe that not always SHPP projects are sustainable forms of energy production.

According to the National Registry, there are as of 2015, 51 registered PPP in SHPP[202] in Serbia. Some examples of projects which are taking place or have been halted are a 103 MW project resulting to the construction of 5 SHPP planned around the city of Vranje. The project is arranged as a dual management by the EPS and Italian developer specialized in energy market.[203] It was expected that the construction would be completed by 2016 but it has not yet started. The Italian company has invested € 9 million for the project, and the contract was signed between the mayor of Vranje[204] and the director of the Italian company through the agreement between the Serbian and Italian governments in 2011. It is currently unclear why the project has not been resumed and or completed, indicating that there is still lack of transparency in the sector.

An additional project which is being planned by an Italian company is to take place in North West Serbia. The project is being planned for the construction of 6 SHPP, with €120 million investments, that would result in total of 60 MW generation capacity.[205]

There has been a halt to one project involving a Serbian company a subsidy of Canadian corporation. The stop in the construction of the hydro plant was due to the local resistance and the residents concern about the environmental impact resulting in difficulty to obtain a development permit. [206]

Overall, SHPP in The Republic of Serbia have achieved 37 MW of installed capacity (as of 2015). [207] This has been the greatest contributor to the country's RES goals with 60% of the target quota met by SHPP thus far. However, for the total goal

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[201] Sikorova, Gallop for CEE Bankwatch Network, "Financing for Hydropower in Protected areas of Southeast Europe", December 2015

[202] Republic of Serbia, Ministry of Energy, 2014, "Progress Report on the Implementation of NREAP, of the Republic of Serbia, http://www.mre.gov.rs/doc/efikasnost-izvori/Progress%20Report%20on%20NREAP%20_SERBIA%202014_ENG_FINAL.pdf?uri=CELEX:32009L0028, date accessed April 2016

[203] Balkan Energy, Sept. 2015, Country Report on Energy Business in Serbia

[204] ibid.

[205] Balkan Energy, Sept. 2015, Country Report on Energy Business in Serbia

[206] Ibid.

[207] MRE, Registar Povlascenjih Prozivodzaca elektricne energije, 2015, http://www.mre.gov.rs/doc/registar08.07.16.html, date accessed: July 2016

of 188MW,[208] SHPP has only achieved around 19% of its target goal. [209]Therefore, we observe, although this is the most developed sector in RES so far, still the total achievement in overall terms is insufficient.

6.2 Wind

Wind energy quota for 2020 has been set to an ambitious 500 MW. This would make Wind responsible for 27% of total share of RES. [210]Wind energy projects have been greatly interesting to investors in Serbia so far. According to the 2016 National Registry, there are some 11 wind projects with the P-PPP status.[211] However, the realization of projects has been thus far halted by various reasons. The main cause for the unstable environment for the realization of wind farm projects is mainly driven by: ill-defined legislations in terms of construction permits (i.e. secondary legislations), unpredictable and unstable legal framework in general, disagreements between banks and ministry on PPA, etc.[212].

Dissatisfaction with legislation has been observed by major global players in the field, and this was pronounced by communication to the government bodies including the PM Aleksandar Vucic. [213] The PM confirmed the government willingness to engage in dialogue with international organizations, as well as to provide incentives for investors.[214]This halt due to legislative obstacles is exemplified by a recent construction project of a wind farm, which has been delayed for some two years already.[215] However, as of June 13. 2016, all necessary legislations which have been seen as "road

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[208] Ministry of Energy and Mining of The Republic of Serbia, "National Renewable Energy Action Plan" (2013), https://www.energy-community.org/pls/portal/docs/2144185.PDF, date accessed: February 2016

[209] MRE, Registar Povlascenjih Prozivodzaca elektricne energije, 2015, http://www.mre.gov.rs/doc/registar08.07.16.html, date accessed: July 2016

[210] Ministry of Energy and Mining of The Republic of Serbia, "National Renewable Energy Action Plan" (2013), https://www.energy-community.org/pls/portal/docs/2144185.PDF, date accessed: February 2016

[211] MRE, Registar Povlascenjih Prozivodzaca elektricne energije, 2016, http://www.mre.gov.rs/doc/registar08.07.16.html, date accessed: July 2016

[212] Serbia Energy, 2013, Serbia: Wind developers claim new electricity purchase model not appropriate for banks, Minenergy confirms quality of solutions, date accessed: June 2016, http://serbia-energy.eu/serbiawind-developers-claim-new-electricity-purchase-model-not-appropriate-for-banks-minenergy-confirms-quality-of-solutions/

[213] Balkan Green Energy News, "Balkan Green Energy", (July 2015) : "Serbia",

[214]IN Serbia, "Vucic: Serbia will provide best conditions for US investors", (June 2015), http://inserbia.info/today/2015/06/vucic-serbia-will-provide-the-best-conditions-for-us-investors/, date accessed: July 2016

[215] Equipment Provider, Sales Western Balkans, personal interview, June 2016

blocks" in project completion, have been adopted. [216] The secondary legislation defines the PPP even further including the conditions, and it even more aligns Serbia's energy law with EU's third energy package. [217][218]

Furthermore, an issue stemming from construction permits, particularly the aspects where the legislation is still lacking defined measure on the construction of wind turbines, has been a great challenge for project realization. In some projects, there have been more than 45 necessary licenses and permits needed for the construction of a wind farm. [219] Issues deriving from misunderstandings between municipal authorities and developers are also common, particularly when it comes to the lack of knowledge and lack of regulation on the particularities of completing the said projects. Issues with financing are quite frequent, and in most cases the EBRD along with the IFC have been responsible for a greater part of financial aid in wind projects.

It is also important to mention that the cooperation with the EMS is significant when considering bigger wind projects, where the developers would need to provide a transmission infrastructure and to comply with the EMS technical requirements to be able to obtain the grid interconnection permit.[220] Moreover, it is also interesting that the government of The Republic of Serbia provides feed in tariffs for wind producers which are three times lower than those for biogas, and solar.[221] This leads to even more challenging condition for wind power producers. Additionally the government of The Republic of Serbia currently has a cap on wind energy production, which states that no more of 3,000 hours should be produced as well as a cap on 500 MW power production has been set. [222] However, this aspect is seen to be rather controversial by many developers, as they see it as being counterproductive for the country. On the other hand,

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[216] Lexology, RES In Serbia: New Secondary Legislation Package Adopted, June 2016, accessed on: June 2016, http://www.lexology.com/library/detail.aspx?g=a4709d80-afaa-42bb-8f96-45b916803f72

[217] EUs third energy package is EUs latest energy market legislation meant to "improve functioning of internal energy market" , European Comission, https://ec.europa.eu/energy/en/topics/markets-and-consumers/market-legislation

[218] Lexology, RES In Serbia: New Secondary Legislation Package Adopted, June 2016, accessed on: June 2016, http://www.lexology.com/library/detail.aspx?g=a4709d80-afaa-42bb-8f96-45b916803f72

[219] Balkan Energy, Sept. 2015, Country Report on Energy Business in Serbiap.63, "Wind Farm in Plandiste"

[220] SEWEA: Turkovic, "Large Scale wind projects in Serbia: Regulatory Challenges and Future Prospects", 2012, http://www.iene.gr/west-balkans-energy2012/articlefiles/4th-session/Turkovic.pdf, date accessed: June 2016

[221] Doing business concerning renewable energy in Serbia, prod. MK Grupa, Jan 21. 2016, 28 min. https://www.youtube.com/watch?v=uam-KDivgUU

[222] Continental Wind, Serbia, 2016, http://continentalwind.com/serbia, date accessed June 2016

this certain quota is placed as the government of The Republic of Serbia in this way is protecting the conventional power plants and energy bill payers. [223]

Currently due to described complexity, only one wind project of 3,3 MW turbine with 0,5 MW current installed capacity is officially opened in the Northern Serbia on November 2015.[224] The Italian developer has completed this project after some 8 years spent in developing time. This time was extremely costly, and therefore the upfront investment has been seen as not profitable in the short term. [225] The medium facility is intended for the local community and therefore did not require any agreements between Serbia's EMS. However, according to the CEO,[226] the process was extremely long due to the bureaucratic process of getting building permits, as the government of Serbia was still not ready for such a project.[227] The developer is currently constructing a second wind park with potential installed capacity of 6,6 MW.[228] With the completion of this particular project, it was displayed that more of such further projects can be developed, with assumption of resolution of all regulative roadblocks.

Serbia's target for 2020 in wind is around 500 MW and so far achieved capacity is 0,5 MW or 0.85%.

6.3 Solar

Advancements in solar power production have been rather slow or perhaps not so significant. The current biggest solar park is a PV power plant with 2 MW output.[229]

There have been thus far some 6 PV projects planned, with outputs of 1MW and greater. However, the most significant project which was planned, yet halted has been a large 1 GW sized project. This project if it was completed would have been one of the biggest [230]solar parks in the world which brings questions if this was "real" and

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[223] SEE Serbia Energy News, "Wind Park business, 500 MW cap quota and investors expectations", (Aug 2015), http://serbia-energy.eu/serbia-wind-park-business-500mw-cap-quota-and-investors-expectations/, date accessed July 2016

[224] Balkan Energy, Sept. 2015, Country Report on Energy Business in Serbia

[225] Doing business concerning renewable energy in Serbia, prod. MK Grupa, Jan 21. 2016, 28 min. https://www.youtube.com/watch?v=uam-KDivgUU

[226] ibid.

[227] ibid.

[228] Wind Power Monthly, "Serbia Installs First Wind Project", (Nov. 2015), http://www.windpowermonthly.com/article/1372730/serbia-installs-first-wind-project, date accessed: June 2016

[229] Solaris Energy, "Solarna Energija in Serbia" 2016, http://www.solarisenergy.co.rs/?lang=en, date accessed: July 2016

[230] Blic, "Srbija dobija najveci solarni park na svetu", (2012), http://www.blic.rs/vesti/tema-dana/srbija-dobija-najveci-solarni-park-na-svetu/3dr50r6, date accessed May 2016

technically feasible project first of all.[231] The project was supposed to employ 500 people, in a part of Southern Serbia, where unemployment rates are the highest.[232]Although it is not completely clear of the exact events which have lead to the halt of the mentioned project, it has been speculated by observing various sources, that Luxemburg based "Securum Equity Partners Europe (SEPE)" was to invest in a 1,7 billion euro 1 GW solar park in southern Serbia. Planned construction was by 2013 completion by 2015, however, around the middle of 2013, the project has been canceled and the company announced that it would initiate proceedings against the Serbian government for not providing the agreed upon land of 3,000 hectares. The Luxemburg company is suing the government for 160 million euros. Again, the circumstances around this projects are quite questionable, since might be used for political purposes and it is considered as a "project" that was never technically feasible.

The main issues stemming with current PV projects are mainly derived from misunderstandings between government officials and investors, also aspects of construction such as the obtainment of necessary permits of the building of the plant are apparent, as (significant) PV projects usually require considerable amounts of land.[233]

The tariffs for PV are considered quite good by investors. Serbia's PV tariff is (as of 2014) 16.3 to 19.8 euro cents/kilowatt hour.[234] However, there exists a separate law which is the one that limits and constraints PV investors. This separate law defines the quota for PV plants, which is extremely low according to investors; 6 MW to ground mounted plants and 4 MW to roof mounted plants. [235] Interest from international investors (as of now mainly German, Chinese, and Italian) is still apparent, however negotiations and talks with local authorities seems to be the main obstacle for the

[231] PV magazine, "Serbia Plans 1GW , 2billion euro solar park", (2012) http://www.pv-magazine.com/archive/articles/beitrag/serbia-plans-1-gw--2-billion-solar-park_100005029/#axzz4F1v3WuZT, date accessed: May 2016

[232] PV Magazine, "Serbia: More details emerge on 1GW solar Park" (2012) http://www.pv-magazine.com/archive/articles/beitrag/serbia--more-details-emerge-on-onegiga-pv-project_100009097/#axzz4F1v3WuZT, date accessed: May 2016

[233] Pavlovic, T. M.,et al: Comparison and Assessment of Electricity Generation ...THERMAL SCIENCE, Year 2011, Vol. 15, No.3, pp. 605-618

[234] PV Magazine, "Serbia inaugurates 2MW solar farm while rejecting PV", (2015), http://www.pv-magazine.com/archive/articles/beitrag/serbia-inaugurates-2-mw-solar-farm-while-rejecting-pv_100017234/#axzz4F1v3WuZT, date accessed May 2016

[235] Joanneum Research Life, "Policy and Regulatory Barriers to Renewable Energy Deployment in SEE", March 2016, http://www.irena.org/EventDocs/Joanneum%20Research,%20Policy%20and%20regulatory%20barriers%20to%20renewable%20energy%20deployment%20in%20South%20East%20Europe.pdf, date accessed: July 2016

completion of projects[236]. The main issue with local authorities is that they are much more in favor of conventional power producers, mainly coal and hydro, and although the central government is apparently in favor of meeting the obligations on sustainable energy, local authorities are seemingly against these new PV plants especially in terms of issuing land permits. [237] However, in respective terms it is also worth mentioning that although Serbia has significant potential towards solar, the main issue is the quota which is 10 MW in the sector. Therefore, making significant investments in the field, with the support of government, difficult.[238]

Solar has thus far met 13% of its quota (2015) in Republic of Serbia. There are however, some 197 PV PPP registered at the national registry (as of 2016). However, the total installed output is just over 1.2 MW. [239]

6.4 Biomass and Biogas

Biomass and biogas have not experienced significant development in the county. There exists however the Biomass Action plan, as well as feed in tariffs for biomass and biogas producers. [240]Main issues which exist for Biomass and Biogas investors are technical barriers, such as lack of estimations on biomass availability,[241] and up until 2012 there has been no professional association for biomass. However, with the help from the Norwegian Assistance to Serbia, a biomass action plan has been established and in turn the technical aspects of biomass development are expected to be improved. [242] Moreover, the previously lacking definition of appropriate terminology has been

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[236] Balkan Energy, Sept. 2015, Country Report on Energy Business in Serbia, Solar

[237] PV Magazine, "Serbia inaugurates 2MW solar farm while rejecting PV", (2015), http://www.pv-magazine.com/archive/articles/beitrag/serbia-inaugurates-2-mw-solar-farm-while-rejecting-pv_100017234/#axzz4F1v3WuZT, date accessed May 2016

[238] PV Magazine, "Serbia Shuns Solar", (2015), http://www.pv-magazine.com/archive/articles/beitrag/serbia-shuns-solar_100017803/#axzz4F1v3WuZT, date accessed: May 2016

[239] MRE, Registar Povlascenjih Prozivodzaca elektricne energije, 2016, http://www.mre.gov.rs/doc/registar08.07.16.html, date accessed: July 2016

[240] until December: 2015 are for bio mass for up to 1 Mw 13,26 euro cents.
For biogas up to 0,2 mw 15,66 euro cents, "Decree on Incentive Measures for Privileged Power Producers" (2014), http://biomasa.undp.org.rs/download/Uredbe/2013-02-02%20Decree%20on%20Incentive%20Measures%20for%20Privileged%20Power%20Producers.pdf

[241] Energy Community, "Serbia Renewable Energy Progress Report" (2010)

[242] SERBIO, "National Biomass Association of Serbia", (2012), http://www.bioenergy-serbia.rs/images/documents/presentation/Biomass_Logistic_and_trade_center_in_Majdanpek_SERBIO.pdf, date accessed: May 2016

improved by the adoption of the new energy law (2014)[243] The focus of development funds (KfW) in the sector has been to increase awareness in biomass and biogas, including technological education. This aspect has been further emphasized for local communities, particularly for the attention of local authorities.[244] There has also been a recent (2015) legislation for the purpose of raising investments in the biogas field as well as promotion of the sector through a public call for the construction of biomass facilities.[245] Thanks to the public call, six companies received funding from the mentioned funds, for the construction of biomass/gas combined heat and power facilities.[246]

There are as of 2015 five biomass PPP with installed capacity of 4,58MWe.[247] There have been two other planned projects in the sector, however not yet completed. [248] Biogas has achieved 8% of target quota, and biomass none in The Republic of Serbia so far.

6.5 Section Summary

RES sectors have developed thus far in different ways. This is mainly due to their differing characteristics, as well as the perception of local authorities which play an increasing role in project completion. As of now, the most developed sector is SHPP. Already by 2015, 60% of the SHPP quota has been met. This is mainly due to the lesser risk involved with the construction of these particular plants. The Republic of Serbia, as mentioned has a long history with hydro power, and therefore awareness and know how in the sector is higher. Also, the projects are mainly smaller ones, have quite steady power output, and therefore financing and overall risk is respectively smaller.

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[243] Kinstellar: "New Serbian Energy Law: Improved Regulatory Framework for Renewable Energy Investments", (Feb. 2015), http://www.kinstellar.com/insights/detail/205/new-serbian-energy-law-improved-regulatory-framework-for-renewable-energy-investments, date accessed: May 2016

[244] Ministry of Mining and Energy of Republic of Serbia, " Progress Report on the Implementation of the National Renewable Energy Action Plan of the Republic of Serbia", (Dec. 2014), https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3552161/0C749E6421E5236AE053C92FA8C02B67.PDF, date accessed: May 2016

[245] UNDP and GEF, Project Document, Serbia, "Reducing Barriers to Accelerate the Development of Biomass Markets Serbia", 2014, https://info.undp.org/docs/pdc/Documents/SRB/FINAL%20PIMS%204382%20Biomass%20Serbia%20prodoc%20%2019%2005%2014%20ENGLISH.pdf, date accessed: June 2016

[246] UNDP: RS "6 new biomass, biogas plants co-generation plants receive total of $1,6m grants from GEF", http://www.rs.undp.org/content/serbia/en/home/presscenter/articles/2015/11/13/6-new-biomass-biogas-co-generation-plants-receive-total-of-us-6m-grants-from-gef.html, date accessed: May 2016

[247] MRE, Registar Povlascenjih Prozivodzaca elektricne energije, 2016, http://www.mre.gov.rs/doc/registar08.07.16.html, date accessed: July 2016

[248] Balkan Energy, Sept. 2015, Country Report on Energy Business in Serbia, Biomass/Biogas

The plants also require far less procedures for construction (land mass they occupy, grid connection, etc.). Therefore, we observe SHPP production intensifying, despite the fact that in some cases SHPP may not be sustainable for the environment.

In terms of wind, there has been only 0.85% of the quota met thus far. This is mainly due to the vast CAPEX needed for wind projects, numerous permits, as well as the up until June 2016 inadequate PPAs. Thus far, we observe almost a stand still of Wind power project completion, as investors have waited for preferential PPAs to be enacted.

In terms of Solar, similarly we observe a reluctance from local authorities, complications in administrative field with obtainment of permits, as well as issues with the land mass that solar occupies. Moreover, the matters of arbitration have appeared in this sector making future investments more risky. Although, tariffs are good, the cap which is set of 10 Mw is far too low for many investors.

In terms of biomass/gas there has been also low levels of power production (8%[249] of quota has been met), however we observe as of late increasing awareness in the sector, as is promoted by development funds and IFIs. Future trend in the sector is therefore expected to increase.

Overall, it is observed, that the access to the markets is not an easy task, particularly in terms of foreign investors. In many cases, local partners are necessary with know-how on procedures and access to local institutions. Moreover, as the formerly centralized power production institution is slowly coming undone, we also observe the emergence of a highly decentralized local authority barriers which are derived fro[i]m the liberalization of EPS and the market as a whole.

[249] Center for International Relations and Sustainable Development (CISRSD), Nov. 2015, A roadmap for deploying renewable energy sources in Serbia and the regional perspective,

Conclusion

The RES market in The Republic of Serbia has been identified as one which requires the both, internal and external drivers to be initiated and supported through its full establishment. By internal drivers it is meant that the state possesses strong willingness to initiate the market and provides the favorable policies, and the external drivers are the outside (foreign) institutions with their own interest to play a role in influencing plausible market initiatives and to benefit from the established market.

Since the RES sector is becoming competitive worldwide, the EU and EU member states (but even more so non-member states) are urged to comply to the global initiatives on establishing goals and targets for the RES production until the year 2020. The Republic of Serbia is no different. However, characteristics of the RES brings a challenging condition for investments, particularly in lesser developed, transitional economies. The high intensity of CAPEX required by RES creates issues with financing. Furthermore, it is a market which takes time to develop and which undergoes different phases of development. The different phases of development integrate financial, regulative and technological initiatives, as well as involvements of different stakeholders including the state, interest groups and a combination of the both in the policy creation. On the other hand, we observe characteristics of Serbia's economy, which can further create a challenging environment for RES investments. Such characteristics bring higher financing risks, high levels of corruption, high unemployment and inability to retain talent. Therefore, we reveal a need for foreign institutions to aid in a more efficient and more plausible manner of development. Politically, The Republic of Serbia is oriented towards the EU integration, attracting foreign investments but also it is observed that a need for a change in the country's energy sector is vital. There also exist positive socioeconomic factors which include the transfer of the RES technology and know-how as well as the reduction of unemployment by creating local jobs not only for engineers, but also the associated services and logistics work force.

Nonetheless, in the last years the Serbian government and relevant stakeholders involved have been part of a journey which includes the improvement of transparency and reduction of corruption in the energy sector (by joining the Energy Community, and the creation of the Energy Agency). By closer monitoring through the mentioned

institutions, stakeholders hope to improve the country's energy situation. Additionally, external factors together with the relevant institution are involved in further market liberalization and the enactment of further policies which assist investors in the RES sector.

The current policy in relation to RES is constantly developing. The Republic of Serbia has a target set for 2020 and the amount of RES to be achieved however, risks still exist. These risks were mainly identified as policy change, technology risk, social awareness and financing.

The role of external players is here the key. Major banks and development funds play a role in the so called "initiation phase" of market development. In this phase, feasibility studies are performed, know how is transferred and awareness to the appropriate authorities is established. When there has been an initiative, which we observe in the Serbia case, the market takeoff phase is vital. Here, the IFIs play a big role in financing the projects, participating in further policy dialogues and supporting the supplementary promotion of the RES.

While The Republic of Serbia is far from the "consolidation phase" of the RES development, there has most certainly been a drastic change in the energy policy in the last years. As a result, we see since 2011 numerous projects planned and potential investors highly interested in the country and its RES market development. The goal of 27% of RES by 2020 seems far ahead, there have been nonetheless considerable changes made. Although the sectors of the RES are most certainly not developing in a synchronized way, deficiencies which exist for project completion are slowly being addressed, and the trend for the RES investments as well as the RES project completion seems to be constantly improving. With the recent adaption of one of the most crucial amendments to the energy law, it is hoped by investors that the RES projects will finally be realized, and that the trend towards clean energy is continued. However, as is proven by practical examples of reviewed projects and activities, the reality of the actual market development confirms a mismatch between the policy, planning and practical RES project implementation so far.

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http://www3.weforum.org/docs/WEF_Human_Capital_Report_2015.pdf, date accessed: July 2016

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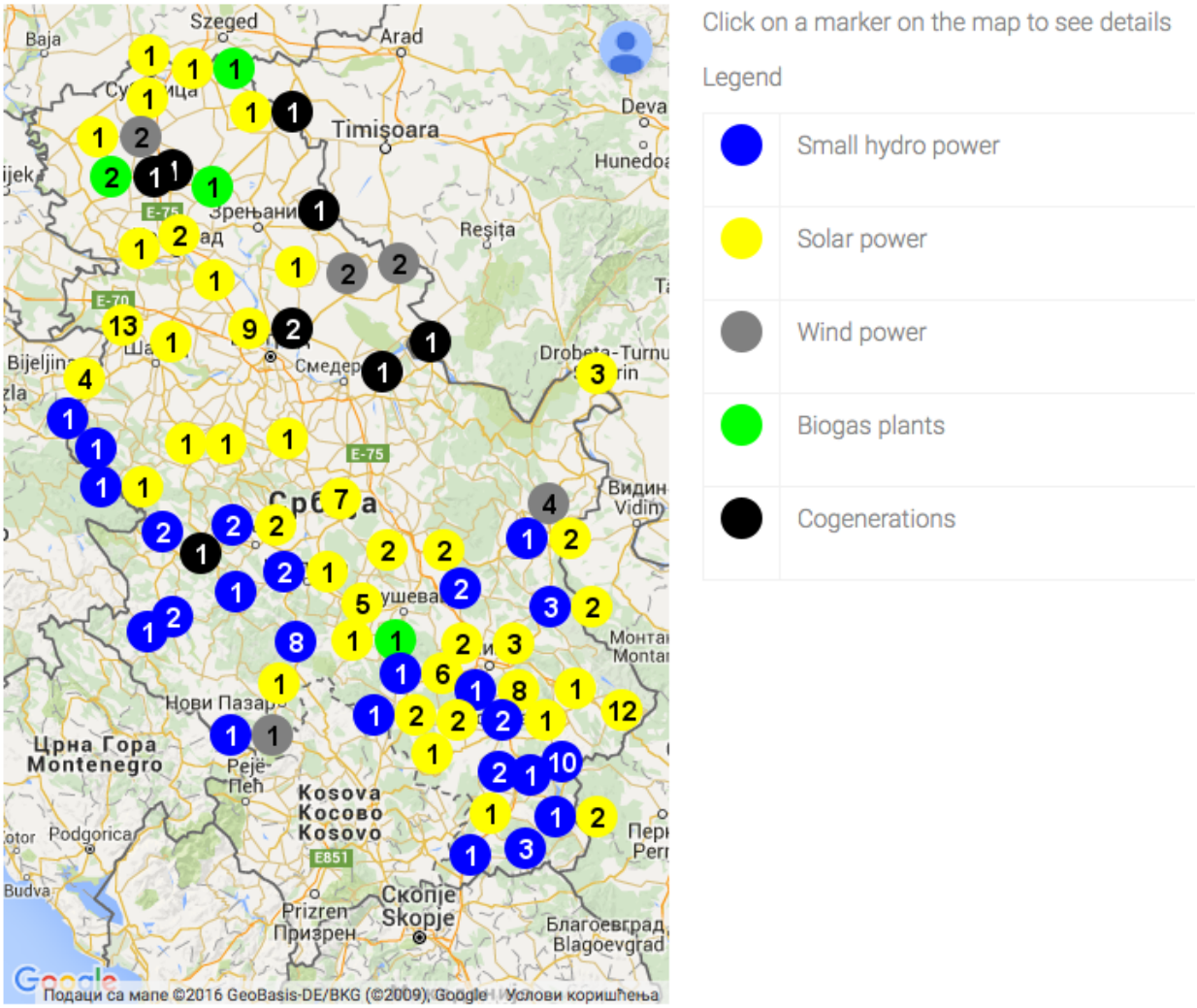
3. Institut za Zeleni Ekonomski Razvoj, about EPS impact on RES market development, July 2016
4. Equipment Provider, Sales Western Balkans, personal interview, June 2016
5. “Manager EMS”, Energy trading center, March 2016

List of appendices

Appendices

Appendix 1: RES Potential Resources in Republic of Serbia

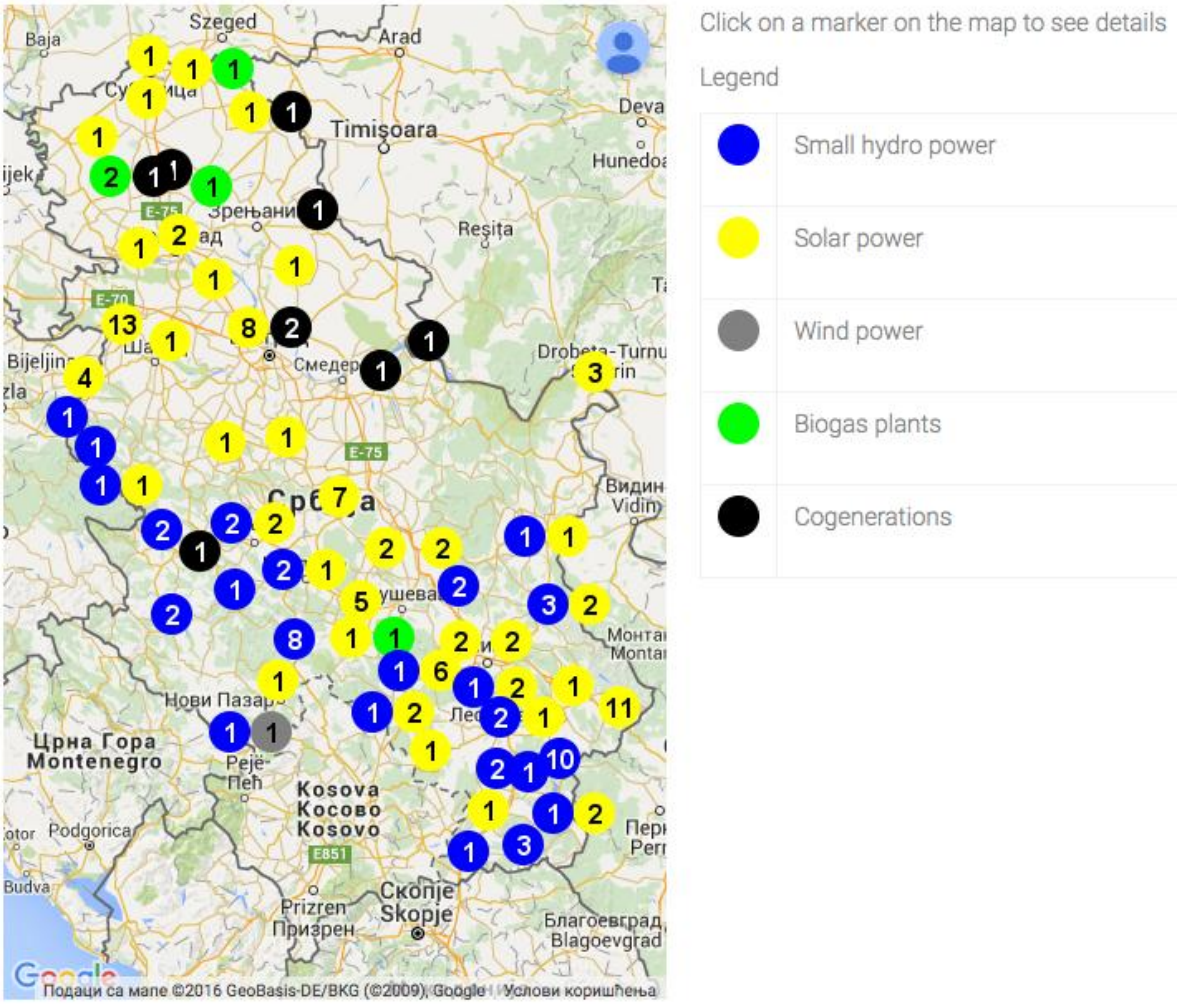
Total Power from planned projects: 103,9 MW



Source: Institute for Green Economic Development November 2015

Total completed Projects as of November 2015

Total Power of Completed Projects: 61.9 MW



Source: Institute for Green Economic Development November 2015

Appendix 2: RES Projects in Service in Republic of Serbia (as of 2015)

RES Projects in Service in Republic of Serbia (based on National targets to be achieved by 2020 MW) Progress Made (MW) as of June 2015

Technologies	Installed capacity June 2015 (MW)	National target in 2020 (MW)
Small hydropower	37.1	188
Wind	0.5	500
Solar	8.5	10
Biomass	0	100
Biogas	4.8	30
Geothermal	0	1
Waste	0	3
Landfill gas	0	10

Source: Institute for Green Economic Development June 2015

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